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Original Articles

Radium Therapy, with Special Reference to Diseases of the Female Pelvis—A Rejoinder

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Job said long ago, "O, that mine enemy would write a book!" But here is one of my best friends penning his lucubrations on a subject about which he appears to me, and I doubt not to others who have spent some years in the study and application of radium therapy, to know but little, and that little evidently from hearsay. (See Dr. Deaver's article in THERAPEUTIC GAZETTE, July 15, 1922.)

His screed does, however, serve one useful purpose for which we are thankful, and that is to exhibit the confusion of the average general professional mind on this comparatively new, very special, most promising, and tremendously aggressive form of therapy. Dr. Deaver also shows a commendable desire to increase his own knowledge touching this new and wonderful therapy. His anti-radium skit bears the general title "Radium Therapy," and the effect of his laborious effort is to convey the impression that this kind of therapy on the whole is a rather useless impediment to our therapeutic armamentarium.

I submit in my brief reply at the outset that it is unfair and destructive to the eager expectation of our sorely afflicted humanity, ever straining its eyes toward the horizon in hopes of relief from some of the diseases with which it is afflicted, to write such a deprecatory article on so valuable, well-known and already well-tried an agent as radium. It is likewise an unpardonable omission not to mention with a heart overflowing with thankfulness the unparalleled blessings which have already come to so many thousand sufferers through this agent in a great variety of fields. I refer here to the lympho- and angiosarcomas of the nasopharynx and of the whole body, to Hodgkin's disease, to the leukemias, to mediastinal tumors, to many brain tumors, to the primary testicular carcinomas, to the sarcomas of the ovary in children, and many other ailments. There ought to be at least a glimmering sense of gratitude that radiation can bring about painless and bloodless cures in ailments in which true surgery has never even dreamed of making an effort—and that, too, radium cures lasting already for years.

Were it not for personal attachment and for the high esteem in which we all hold Deaver as one of our keenest kutters and most doughty wielders of the scalpel, I would dismiss his strictures upon radium with the citation of an old college skit on Bishop Berkeley, the idealist, which ran, "When Bishop Berkeley said there was no matter, it was no matter what Bishop Berkeley said." But inasmuch as I profess to be a cosmothetic idealist, I will try to undo some of the harm Deaver's misleading and injudicious article may have wrought.

Let us pass in silence his reference to the "biologic effect of radium" and the "law of Bergonié and Tribontleau," to which he adverts after the gingerly fashion of one

who craves credit for erudition, but who is conscious of treading boggy ground. Let me also remind him that it is no longer necessary, or even good taste, as in our boyhood's days when we were in the University of Pennsylvania some forty years ago, to bolster our articles by citing samples of foreign authorities on subjects with which we are ourselves perfectly conversant, in fields in which our own American men have had an abundant experience, and concerning which they have repeatedly expressed themselves, and where their judgment is decisive.

We all heartily concur with Deaver in urging a continuance of the campaign to bring patients to treatment in the early stages of cancer, and, where possible, to remove the causes of irritation, the forerunners of certain cancers. It should be remembered, however, in the fight against cancer that our means of knowing the early stages are limited except in a few well-defined localities. Even if a diagnosis could be made, how many cancers of the brain, cancers of the lung, cancers of the pancreas and so forth could be cured by operation? One might say, therefore, that the broad statement that in the early stage cancer is local, amenable to treatment, and almost certain of cure, is somewhat of a surgical illusion.

Passing over the other large realms radium has conquered for itself, I limit myself to the four gynecological conditions which Deaver discusses, dealing with ascertained facts established by some ten years' experience in treating several thousand cases. These conditions are:

1. Fibroid tumor of the uterus.
2. Hemorrhagic uterus.
3. Cancer of the body of the uterus.
4. Cancer of the cervix.

As one of the pioneers of gynecologic surgery in the late eighties and nineties of the last century, I have operated for all these conditions innumerable times, and with an ever diminishing mortality, until my hysterectomies became among the safest of all major surgical procedures. This mortality immunity was due to the knowledge gained by the terrific sacrifices of some of the early German operators, notably Carl Schroeder, as well as to the splendid work of Thomas Keith; of our own Stimson, of New York; of Joe Price and Benny Baer, of Philadelphia, and many others. We need not hunt laboriously in foreign literature for citations when we come to review the steps leading to the perfection of this great surgical achievement. In this particular field with which I am dealing, Joe Price and his followers can tell us the whole story.

Fibroid Tumor of the Uterus.—Let me pronounce this dictum: he who would give his patient the same consideration he would give to his wife or his sister, must put radium first in the treatment of fibroid tumors. Not all fibroids need any treatment, and it is often my agreeable function to tell the patient, who comes dreading the operation, to go home and forget her tumor. The fibroids calling for treatment are those which are growing, those that are bleeding, those that disturb function or cause pain by pressure on neighboring organs, and those whose nature is in doubt. In the last group we include those in which a clear diagnosis is not possible. The indication for treatment or operation must be something more than the mere discovery of a tumor; too many doctors eager to operate still think otherwise and cry *"ubi fibroma, ibi opera!"*

Let us analyze the situation and emphasize some salient points. A patient comes, say at the age of forty or over, with hemorrhages or with a large and uncomfortable tumor loosely filling the pelvis, rising up into the lower abdomen, reaching the umbilicus or even extending above it. My first query is whether or no the excessive flow is caused by a polyp in the vagina or uterus. Then, that being excluded, can I stop the flow and reduce or cause the tumor to disappear with radium? If there is anything suspicious about the tumor, in the rapidity of its growth and its softness, or any suspicion of an ovarian tumor complicating it, or lateral inflammatory disease, then operation is the choice. I know of no satisfaction in surgery greater than the removal of a difficult complicated fibroid uterus. There are, however, some, even of

these doubtful cases, with severe heart disease or other serious dyscrasia, in which radium is preferable.

Every patient with a uterine fibroid with bleeding or discharge should be subjected to a preliminary dilatation and curettement as a routine procedure. This excludes the mucous polyp or the pedunculate fibroid tumor, and gives positive knowledge as to the presence or absence of cancer. If cancer of the body is found, operation is usually the choice.

In the uncomplicated fibroids, especially when associated with excessive bleeding, there is no treatment as satisfactory as radium. In our hands there has been, in several hundred cases, no mortality, and the bleeding can be checked in almost every case. There is a consensus of opinion that radium treatment is applicable to small fibroids; there is some doubt as to its use in large fibroids. I should like to go on record here to the effect that in a high percentage of the large tumors there is either a complete disappearance or a marked reduction in the size of the large growth. The radiation as a rule in no way interferes with, or makes more difficult, or contraindicates a later operation if necessary. Calcified fibroids, cystic fibroids and occasionally other forms do not respond by decrease in size. Patients receiving treatment are kept in the hospital on an average of a day or two, working women can go steadily along with their occupations, and one treatment usually suffices.

In a younger woman the problem is somewhat different. Here, while it is possible to radiate and dissipate the tumors, and still to retain the menstrual function, as a rule radium therapy entails the cessation of the menstruation, as does hysterectomy. The best procedure in the young is, as I have repeatedly done, to open the abdomen, extirpate the tumors, and leave the uterus (myomectomy). With surprising frequency in well selected cases one finds only one big globular myoma, which can be enucleated, leaving a normal uterus. Let it be borne in mind, however, that the fibroid may be radiated away entirely and the menstruation and the power of conception preserved. We have had this happy development in several of our own cases. Radiated fibroids often disappear completely, but even if the fibroid only shrinks and causes no more trouble the result is satisfactory, inasmuch as some 20 per cent of all women have just such small fibroids, and many never even know it. It is blessed foolishness to declare that a mutilating surgical operation, which removes the womb just for the sake of getting out some fibroid tumors encapsulated in it, is a satisfactory operation, while to stop the growth of the tumor and shrink it with radium is unsatisfactory. Surgery developing in men's hands has dealt too lightly with mutilating operations in women; I wish the case might be reversed for several decades, women operating and men suffering the mutilations. I think there would be a large prepossession in favor of wise conservatism.

Hemorrhagic Uterus.—What we might symptomatically call "essential hemorrhage" of the uterus is one of the most distressing groups of cases seen by the gynecologist; women in the forties, anemic and worn out by hemorrhages, with no palpable lesion, or perhaps only an enlarged uterus, which nothing short of hysterectomy has hitherto been able to relieve. They suffer for years, become sallow and waxen, short of breath, incapable of sustained exertion, and are, in short, profoundly invalided. The most the examination reveals is the large free uterus, without lateral disease. Efforts to give more than a brief respite by packing or curettage or intrauterine applications are futile. In the old days before the microscope was commonly in use, these were mistaken for cancerous uteri, and as well-defined cancer was then (aside from hysteromyomectomy) the only generally accepted reason for a total extirpation, the removal of one of these uteri was often a source of humiliation to the surgeon. But, even so, there was no cure for the disease but ablation with its attendant risks, discomforts, and often disabilities following.

I digress a moment here in order to interpolate that when I say an operation is "safe" or "dangerous" or "entails sundry

disadvantages," I refer to the operation as done by the average competent surgeon all over the land. I submit that it is an ignoble and egotistic argument in recommending a procedure to inform the reader how safe it is in my own personal hands, with the ill-concealed implication that I can do it better than my colleagues. We passed through this phase of self-aggrandizement in the early ovariotomy days, and it was not a creditable one. I utter this caustic comment all the more freely as I must plead guilty. What we want always to know is, what chance has the patient in the hands of any of our hundreds of zealous, fine American surgeons?

At last in this emergency of the hemorrhagic uteri, when we were doing such a tremendous operation merely to check hemorrhage, radium came to our aid, and by the simple expedient of inserting a tube of radium into such a bleeding uterus, say 100 milligrammes for fifteen hours or its equivalent, presto! the hemorrhages disappeared and the patient was cured. This is so far the greatest triumph in surgery since this century began. Surgery here performs hari-kari, gets rid of itself for the benefit of suffering humanity.

Deaver must not slur this triumph of radium therapy by exposing his own guileless innocence of pathology and attempting to foist it onto the shoulders of the profession at large, by calling the designation myopathic hemorrhages "a glib term." The condition is a perfectly clear clinical and pathological entity, well worked out. He here cries out as an overwrought soul in great distress over "the danger in young women of producing an artificial menopause." It gives me pleasure to allay his fears by informing him that this condition is rarely found in young women, nor is radium used in young women until every other means has been exhausted, and when as a last resort the mutilation of hysterectomy looms up as necessary to save life, or to forfend permanent invalidism. In these myopathic hemorrhages what a blessed alternative we have in radium—so simple, so speedy, so safe, and so certain! Why, if radium did nothing else but bring relief to this one group and eliminate surgery, it would be worth all the investments of all the clinics in the country. How pleasant it is to be able to docket this fairly common, serious disease, with the comment, "We have a specific for that—radium!" Let every surgical text-book record this: "Myopathic Hemorrhagic Uteri. Treatment, Radium. Surgery? Never!"

But take the case of the young woman afflicted with hemorrhages from other causes; even there one can use radium with care, for it is notably difficult to stop menstruation in early life, even when you want to; to check hemorrhage here give a smaller dose, say one-half of that necessary to bring on the menopause. Menstruation may stop for a while, but it is almost certain to return duly regulated after a few months or a year or two. But Deaver weeps over the danger of stopping menstruation in young women by the use of radium. Well, Brother Deaver, please tell us what you do when you take the uterus out for an uncontrollable hemorrhage? By what magic do you preserve menstruation? No, my friend, we want no surgery here; and I say it though my whole life has been devoted to surgery, to doing it, to writing about it, and to teaching it. Away with the surgeon in this field; show him the back door!

Cancer of the Body of the Uterus.—It has been a generally accepted rule that cancer of the body of the uterus is not suitable for radium therapy. The reasons for this assumption are, first, that operative results are extremely good, and, secondly, that there is uncertainty in the application of the radium—the treatment may not reach the right spot in the large cavity. But experience has already repeatedly shown me the folly of this assumption, for I have seen many women with cancer of the body upon whom it was impossible to operate and where radium was the only hope: practically every one has been benefited, and here and there one is apparently cured. I still believe that surgery is the method of choice, but I am thankful where surgery is excluded to be able to use radium with so much success and the hope of a pro-

longed and remarkable improvement. In some of these patients curettage at a later date has shown the changes characteristic of radium and an apparent entire absence of any cancer.

Let us sometimes, with the patient's peace of mind in view, use the word "cure" in a modified sense. "Palliation" is relief, more or less complete, of distressing symptoms, while the disease obviously remains, to advance at a later date. When shall we use the word "cure" in reference to an apparently effective cancer operation or treatment? If we demand certainty, then we can never say a patient is cured, for the five or even ten year limit is purely arbitrary and not decisive. Why not then say "cure" when after the first year there are no discoverable signs of disease, being aware that there will be a certain percentage of relapses? I urge this in the interest of the patient, who can then for a time forget the sword of Damocles. I commonly say to the patient, "As far as I can see you are perfectly well, and I am expecting you to remain well; now go about your business, but report to me every five or six months, for several years." Let us not be so ultra-scientific as to forget the patient's point of view.

Cancer of the Cervix.—Now I come to cancer of the cervix. This is manifestly Deaver's crux, and here he falls into a distressing error in comparing operative with radium cures. Let me ventilate his confused logic and false conclusion by transferring the comparison to another field. Suppose I had declared some years ago that I now had a new and successful *method of treating all breast cancers*, of whatever nature and however advanced, and that I received and treated all cases indiscriminately as they came to me, and was then able to report a 20-per-cent five-to-seven-year cure. Then along comes a zealous disciple of the knife, *who has only operated upon selected cases* which showed no axillary involvement or distribution beyond the freely movable breast, rushing into the arena crying, "Hey, I have far better results, I have saved 25 per cent by operation. Away with your new remedy!" Where, I ask, is the sense of comparing such utterly dissimilar groups except to declare at once, "How far superior is the method which deals so successfully even with the advanced hitherto hopeless cases."

I thought that I detected as I read this extraordinary statement of Deaver's, professedly taken from Clark's data, the unsavory odor of a very defunct rat, so I wrote at once to John G. Clark and asked him whether or not in his citation he had included all cancer cases in his list of radium cures, or merely those which were also favorable from an operative standpoint. He replied that the two groups were utterly diverse and not to be compared at all, that *his radium cures included all cases indiscriminately.* I quote from his letter of July 18: "You are quite right in your interpretation of my view-point. Of the large number of cases which we have treated for the last year or two practically none were operable, and because of the astounding good results in some of the apparently hopeless instances, we have very materially decreased the number of our operations in cancer of the cervix. Indeed we scarcely operate any more in the latter cases. I have always tried to emphasize as strongly as possible the fact that if we can get a twenty-per-cent three-year salvage in the hopeless cases we ought to do better than thirty-three per cent in the operable cases of very limited growths, hitherto submitted to a very extensive panhysterectomy." Deaver, old man, we must rightly use and not abuse statistics!

There are, broadly speaking, from the standpoint of the radium therapeutist, three groups of cases of cancer of the cervix:

1. With extensive lateral involvement and fixation (Fig. 1).

2. Where the lateral infiltration is moderate (Fig. 2), and where neither side is fixed.

3. Where the disease (Fig. 3) appears limited to the cervix and mobility is not interfered with.

A rectal examination is imperative and decisive as to extent in nearly all cases. In the first group operation is worse than futile; radium often, however, gives great

relief in checking hemorrhages and discharges and relieving pain. Occasionally one gets a cure here if enough radium is judiciously used. I reported such a case in the Ransohoff Memorial Volume. I cite it in brief with figures. I saw the patient in January, 1920, when she had an extensive can-

FIG. 1.—Diagram of a carcinoma of the cervix spreading out to the pelvic wall and fixing it.

cer of the uterus, with disease extending from half-way up the vagina to the fundus of the uterus. The involvement of the vaginal wall accounted for her bladder distress, while the obvious breaking down cancerous tissue explained hemorrhages. Curettage and microscopic sections fully confirmed the obvious clinical diagnosis. I gave her a radium treatment of 1208 mg. for three hours and forty minutes, distributed over three areas in the uterine cavity and in the cervix. Examined April 15, two and a half months later, there was no trace of the disease, not even on microscopic examination of the tissues removed. All distressing symptoms disappeared and she had gained weight and strength. Her last note, of July 1, 1922, says that she is perfectly well and has never had better health.

Group 2, with evident lateral involvement, is a group where the surgeon's hands ought to be tied. Here again radium palliates without the risk of operation, and I include in that risk not death alone but fistulas and hernias from the infected abdominal wound. Here, too, radium often cures and surgery practically never.

In Group 3 it is quite certain that radium gives a high percentage of permanent cures, almost certainly higher than operation alone, and without its attendant mortality and morbidity. In those early cases in which the general condition of the patient is good, a combination of operation and radium is for the present highly to be recommended, that we may know whether the combination gives us the best frontal attack on our dread enemy. Such a combined treatment may well be better than either radium or surgery alone. It also makes possible the implantation of radium points into any discovered glandular metastases. Where preoperative radiation is given, the operation should be done in the first three or four days after radiation. A longer period of delay leads to sclerosis of the parts and makes the operation much more difficult.

Dr. C. F. Burnam, my associate, has recently reported (American Radium Society, St. Louis, Mo., May 22, 1922) on our cancers of the cervix treated prior to January, 1915. Of ten operable cases treated by combination of radium and operation, five are living and well to-day. Of four cases

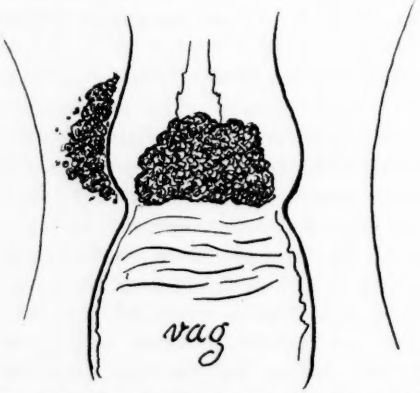

FIG. 2.—Diagram of a carcinoma spreading out in the right broad ligament, but not yet fixing the cervix or reaching the pelvic wall.

treated by radium alone on account of bad physical condition, two survived; fifty per cent of seven-year cures in each group. Fifteen cases primarily operable or inoperable recurrent in 1915 are in May, 1922, living and well. I think such results speak for themselves.

I have no quarrel with the man who goes

on operating for the present on his properly selected cases of cancer of the cervix, for we who are engaged in a new work, exploiting fresh fields, have no right to expect the entire profession, busy about so many things, to catch our vision at once. But I do have a gravamen of complaint against any one who would hinder our work, rob our patients of their hope, and some of their lives, and, by disseminating doubts, and by innuendo, obstruct our path. I also inveigh against him who operates on Groups 1 and 2, which are so obviously unfit.

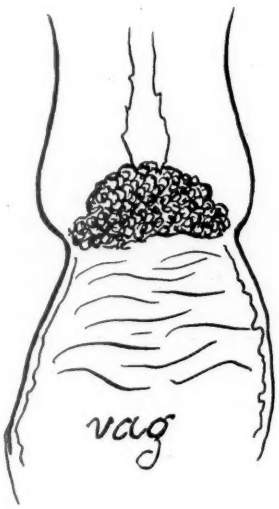

FIG. 3.—Diagram of an early carcinoma limited to the cervix.

The truth of the matter is that radium already occupies a vast field carved out of the domains of general and special medicine. It is unjust to the sick and suffering to pen a diatribe against radium therapy, mentioning only several circumscribed fields and leaving the impression that it is of but little service, just at the time when the afflicted public is anxiously asking, "Can we expect any help from radium?" It would take a large volume to record all the triumphs of radium. It has come to us as one of the most valuable adjuvants our therapeutic armanentarium has ever welcomed. So far as I know, no one has ever professed that it was a panacea. Exaggerations have been limited for the most part to the public press.

When my friend declares that radium is a failure in the face of these overwhelming experiences, I reply in the words of Priscilla of old, "Speak for yourself, John!"

The Evil of Procrastination in the Management of Hematuria[1]

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Bleeding from any part of the uninary tract may give rise to that mixture of blood and urine called hematuria. Many authors limit this term to those cases in which enough blood is present to be macroscopically visible; it should, however, apply to all cases of blood in the urine. A patient's attention is immediately attracted to the presence of blood in the urine, and he usually hastens to consult his physician. It is remarkable how little attention is paid to it by many general practitioners.

The incidence of hematuria is very frequent, as one would expect from its numerous causes. Therefore, I cannot emphasize too strongly the importance of ascertaining the source of bleeding in all cases of hematuria. Blood in the urine neither indicates

[1]Read before a joint meeting of the Philadelphia County Medical and Philadelphia Genito-Urinary Societies, May 24, 1922.

the part of the tract it comes from nor its causatory disease.

The clinical history, the urinary findings, and the general physical examination of the body as a whole, particularly of the urinary tract, must all be used as adjuncts in answering these two important questions; important, because no rational therapeutic measures can be employed before the source of the bleeding and its cause are known: (1) Many still adhere to the term "essential hematuria;" the writer is in accord with Dudgeon in a recent article, in which he states that as the various causes of hematuria are learned the term essential hematuria will probably disappear from the classification, just as idiopathic is so rapidly disappearing from the terminology of peritonitis. (2) The following causes of hematuria arising from lesions of the kidney: Acute and chronic nephritis, trauma, stone, embolism, and renal infarcts; thrombosis of the renal veins, aneurism of the renal artery, varices, and telangiectases of the kidney and its pelvis, renal tuberculosis, syphilis and tumors of the kidney; hydronephrosis, pyelitis, and pyonephrosis; movable kidney, hematuria in the course of pregnancy or during lactation, bleeding as a result of sudden relief of a urinary tension in the bladder, sclerosis of the renal vessels, pyelitis, and chronic passive congestion of the kidneys.

Hematuria with its origin, from parts of the urinary tract other than the kidney, may be enumerated as, first, from the ureters, such as injuries, stone, tuberculosis, new growths, varicosities, and inflammatory diseases.

Bleeding of bladder origin may be mentioned, tumors either benign or malignant, injuries, rupture of the bladder, cystitis, in all its clinical stages, and the various parasitic infections.

Prostatism, inflammatory diseases of the prostate gland, and tumors are common sources of urinary hemorrhage.

From the urethra: new growths, stone or foreign bodies, injuries, and urethritis.

Certain nervous diseases, such as tabes dorsalis, multiple neuritis, and hysteria, may produce hematuria; various peculiar blood conditions, as hemophilia, scurvy, and purpura; also jaundice and the various leukemias.

General systemic intoxications: for example, the acute malignant fevers, such as smallpox, typhoid, and malaria. The ingestion of certain drugs: cantharides, turpentine, and particularly the prolonged use and excessive dosage of hexamethylene.

When one considers the long list of conditions with which blood in the urine is associated, it may be assumed that many of them can readily be differentiated by the general practitioner, and that they rarely come to the attention of the urologist.

The opinion of a majority of authors is, that the most common cause of renal hematuria is probably nephritis. In most cases, however, the hemorrhage associated with Bright's disease is of small quantity. Julius Manneberg (from Zuckerkandl's Handbook of Urology) as far back as 1905 furnished an interesting contribution to this question: In 43 cases of acute nephritis he observed severe hemorrhage 6 times; in 45 cases of subacute nephritis, 5 times; in 200 cases of chronic nephritis, 15 times; and in amyloid disease of the kidney not once. That very severe hemorrhages may occur from nephritis has long been recognized; Rayer observed such cases as long ago as 1839; Naunyn reported three cases of fatal hemorrhage from this condition. Guyon believes that the commonest form of bleeding is the hemorrhage due to an enlarged prostate.

Rather severe types of hemorrhage may accompany acute urethral inflammations.

The severest types of hemorrhage, I believe, are met with in bladder tumors.

One of the important points that the writer wishes to bring out in this paper is the fact that not infrequently sudden frank hemorrhages may occur with no prodromal symptomatology, the hemorrhage itself being the only symptom, and that symptom disappearing as suddenly as it appeared. It is this class of cases that the physician is at times prone to treat with little or no concern, and it is in these cases also in

which the evil of procrastination is clearly evident, in that the patient has been allowed to drift along, as it were, with some placebo form of treatment.

Months later, perhaps, a recurrence of bleeding takes place, and investigation along proper lines and methods for determining the underlying cause or source of the hemorrhage reveals an extensive pathologic lesion, or some far advanced malignancy, which may even preclude operative intervention.

Surely one must be impressed with the quotation that "Procrastination is the thief of time," and that we would be guilty of stealing valuable time from the patient and committing a grave sin of omission if we neglected to ascertain in the first place from whence the bleeding came.

As has been previously mentioned, in a great many instances the medical practitioner can readily diagnose the causative factor that is producing the hemorrhage. It should also be remembered that hematuria is only a symptom, and that the indication is not to treat it, but to base the treatment entirely on the underlying cause.

Only in cases of severe traumatic injuries is it necessary to consider the treatment of the hemorrhage itself.

In all cases of hematuria the patient should be ordered to bed, with complete rest. The general treatment depends on the amount of blood that is being lost, and the early recognition of the source of the hemorrhage.

In bleeding from the upper urinary tract a prompt cystoscopic examination should be urged during the occurrence of the hemorrhage. This will enable one to decide on prompt measures for relief.

The passage of a ureteral catheter will sometimes control hemorrhage from the renal organs or the ureter; one is also enabled to instill through the catheter styptics such as adrenalin solution, etc.

In severe bladder hemorrhages an attempt to control bleeding by vesical irrigations should always be made; if this procedure fails, a suprapubic cystotomy can be done, which will allow one to deal directly with the areas of bleeding.

Through a suprapubic wound we will also have easy access to the prostatic area, which can be tamponed firmly, and in this way control hemorrhage emanating from the deep urethra.

Another method of controlling urethral bleeding is to pass a soft-rubber catheter; this will act as a splint while a tight circular bandage is applied to the penis.

In certain cases the use of horse serum may be resorted to.

When extensive injury has occurred to any part of the urinary tract, the surgeon should be consulted immediately, as radical surgical procedures are necessary in order to control the hemorrhage. Especially is this true in severe trauma to the kidney, when a prompt nephrectomy is often necessary to save the life of the patient.

In conclusion I wish to make a plea for a closer alliance between the internist, the roentgenologist, and the urologist, in the management of these cases of hematuria, for with such an alliance the source of the lesion or disease causing hemorrhage from the urinary tract can be made with a greater degree of certainty and expediency, and thus conserve the life and health of the patient; then the word "proscrastination" could well be eliminated from the title of this paper.

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Carbohydrate Intolerance and its Relation to Hypertension, Nephritis, Cardiovascular-renal Disease, Pellagra, Rheumatism, Acne, and Urticaria[1]

BY J. F. YARBROUGH, M.D.
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That a misunderstanding may be avoided, let me say in the beginning that the carbohydrate referred to in this paper is that contained in sweets and starches, and not that contained in fresh fruits and vegetables.

The author stated in a paper read before the Houston County Medical Society in 1912 that carbohydrate intolerance was the etiologic factor not alone in pellagra, but in many other allied conditions; such as hypertension, gastric ulcer, rheumatism, nephritis, acne, and dysmenorrhea. Again, in a paper read before the same society in 1916, the attention of the profession was called a second time to this condition as follows: "In the study of pellagra during the past four years we have learned many things in regard to the treatment and diet of other pathologic conditions, which when thoroughly understood will, I believe, revolutionize our conduct of these cases."

We know that all organic functional activity produces many by-products. We also know that the liver is the great neutralizer of these by-products. Now, when a normal balanced diet is consumed the liver is well able to take care of these by-products, but when a carbohydrate or alcoholic diet is almost exclusively consumed, we find these by-products enormously increased. Under this extra burden the liver becomes unable to perform its proper function and an accumulation of these by-products follows. The result is a crippled metabolic activity, as well as a derangement of all the normal functions of the body. A derangement of the digestive functions naturally follows. If this condition is prolonged there may be developed pellagra, acne, hyperchlorhydria, muscular and articular rheumatism, nephritis, and hypertension. As all these patients consume a faulty, or rather an almost exclusive, carbohydrate diet, a carbohydrate diathesis is evidently the fertile soil on which they develop.

This theory was again called to the attention of the profession in a paper read by the author before the Tri-County Association in Arlington, Georgia, March 17, 1917. He said in this paper that "The symptom-complex we call pellagra is an acidosis, the result of a carbohydrate diet, and this diet is the basic foundation of many pathologic conditions." In support of this theory facts as follows were given: "The appearance of pellagra in the United States contemporaneously with the increased consumption of the carbohydrates strongly supports our theory."

One frequently hears a physician say we ate the same things fifty years ago that we eat to-day; why did we not have pellagra then? This query is based on an erroneous premise. The census report shows a radical difference in the diet of fifty years ago and that of to-day. The increase in the consumption of sugar in the past decade has been more than five hundred per cent. In 1916 there was consumed a little less than one hundred pounds per capita. The increase in the consumption of syrup enormously exceeds that of sugar. We had but a few sweet potatoes fifty years ago, but now, by reason of the canning process, they are a staple article of diet the year round. There is more rice consumed in America to-day than ever before in its history. The increase in the consumption of soft drinks, as noted in the *A. M. A. Journal* of January 27, 1917, is simply astounding. The

[1]Read by invitation before the Escambis County Medical Society at Pensacola, Fla.

retail value of these products and ice cream in 1916 was very near the billion dollar mark.

The author has been challenged to show why the Chinese do not have pellagra, living as they do almost wholly on rice. This is not the case; the Chinese have used soya-bean flour (the richest protein food known) for over two thousand years. They are also large consumers of fish; with such diet how could they have pellagra? However, the statement that they do not have pellagra is not true. There are some cases of pellagra in China, and possibly more sprue than in any other nation. We find that these patients live almost wholly on rice. In a paper read before the Medical Association of Alabama on April 20, 1921, some additional facts were offered. The author stated in this paper that he believed that the true etiology of this condition would be found in a carbohydrate intolerance, and offered some facts on which this belief was founded:

First, the history of every case with which he had to deal showed a large preponderance of carbohydrates in the diet.

Second, they all showed a state benefited by the use of alkalies.

Third, in former years a large percentage of our nephritics were addicts to the use of alcohol (a pure carbohydrate product).

Fourth, a careful study of the part played by the carbohydrates in the process of digestion also offered strong proof of the hypothesis that an excess of acid is found.

Since writing the last paper a mass of corroborative evidence has been secured in support of the etiology. In the *A. M. A. Journal* of August 27, 1921, we find this statement by Doctor Hara: "Experiments on rabbits confirmed the injurious action on the kidneys of acid infused or produced in the body. A diet which induces an alkaline reaction in the urine has a pronounced protective action against experimental nephritis." June 3, 1921, in a paper read before the American Therapeutic Society, Dr. John C. Hemmeter offers strong evidence in support of our carbohydrate theory. He says that "the blood of the human being normally contains 3/1000 of alcohol; the blood of several total abstainers examined, who live largely on carbohydrates, a slightly higher proportion of alcohol. The distillate of the human feces yielded a considerable percentage of alcohol, being largely from intestinal fermentation of carbohydrates and sugars, for the alcohol was made from the sugars; and as total abstainers were proverbially large consumers of sugar they produced a little more alcohol than the consumer of alcohol, for the latter lived largely on a protein diet, from which no alcohol could be formed. The total abstainer is the unconscious manufacturer of alcohol, since he has the most favorable conditions for forming it. Though the percentage of alcohol formed is small, yet it can be estimated as having a pharmacologic effect because of continuous action."

In a former paper the nervous phenomenon accompanying pellagra was described as an alcoholic neurosis, and that a type of rheumatism had its origin in the fermenting of the carbohydrates and that its origin would be found in the colon. These observations have been strongly corroborated in the report of the government's commission appointed to study both conditions during the war. The one reported that the nervous phenomenon accompanying pellagra was evidently of toxic origin, and very closely resembled that found in chronic alcoholism; the other reported that a large number of cases examined showed no foci of infection, and that they believed the focus was in the colon, the result of a carbohydrate diet.

A paper by Dr. Robert McCarrison in the *Journal of the Am. Med. Assn.* of January 7, 1922, offers some incontrovertible evidence. The doctor was in a remote part of the Himalayas for nine years. While there he had ample opportunity to study nutritional diseases among those nomadic peoples. In his article he compares the digestive functions of those wild people with those of the civilized races. He also made some experiments with monkeys that, it seems to me, ought to be sufficient to impress the most skeptical.

He writes: "During the nine years of my association with these peoples I never saw a case of asthenic dyspepsia, gastric or duodenal ulcer, appendicitis, mucous colitis, or cancer, although my operating list averaged four hundred operations a year." One of his reasons for the absence of these diseases is that the people live on the unsophisticated foods of nature—milk, eggs, grains, fruits, and vegetables. He says further that not one in a thousand of them ever saw a tinned salmon, a chocolate, or a patent food, and there is not as much sugar used by the tribe in a year as there is in one of our modern hotels in a day. Their religion prohibits alcohol, and they are practically a teetotal race.

In contrasting the habits of uncivilized with civilized people, he says the former are content with natural foods—milk, eggs, grains, fruits, and leafy vegetables. These natural foods—the protective foods, as McCollum has named them—provide in proper quantity and proportion the proximate principles and vitamins necessary for nutritional harmony, and the proper vegetable residues for the healthy evacuation of the bowels. Civilized people are not satisfied with these unsophisticated foods. Their animal food is heated, dried, frozen, thawed, and stored. One way or another by desiccation, chemicals, heating, freezing, thawing, oxidation, decomposition, milling and polishing the principles of civilization are applied, with the elimination of the natural and the substitution of the artificial in the food they eat and the fluid they drink. From such faulty foods the gastrointestinal function is the first to suffer. McCarrison illustrates this point by giving his experiments with wild monkeys (thirty-six wild monkeys were captured in the jungles of Madras). They were perfect specimens of health and vigor. Twelve of them were fed on natural food; the remaining twenty-four received food deficient in some cases in vitamins, as well as ill balanced; others were fed on natural food, in which the living essences had been destroyed by sterilization. Those that were naturally fed remained free from intestinal diseases; those that were fed on a deficient and ill-balanced diet, and on a sterilized food, developed in a short time, in the majority of cases, diarrhea or actual dysentery. Here then is an unequivocal instance not only of the effect of faulty food in inducing a specific disease, such as dysentery, but the protection against it that is afforded by a natural and well-balanced food.

It is thus that such a nutritional disease as pellagra arises, and thus that the manifold varieties of gastrointestinal disorders, due to failure of digestive function, may come into being. One can see throughout his article what he means by faulty food; an excess of carbohydrates in the diet, as well as by destroying the vitamins by various processes. He goes on to state that we have from faulty food, first, diarrhea; second, dysentery; third, dyspepsia and gastric dilatation; fourth, gastric and duodenal ulcer; fifth, intussusception; sixth, colitis; seventh, failure of colonic function; and further, he does not deny the influence of microbic or other pathologic agents in contributing to their production. But he does maintain that faulty food is often at the bottom of their causation.

I am glad McCarrison made the latter assertion, because in some quarters the author has been criticized for saying in a former paper that he believed the only germs in this condition were those accidental or incidental to this abnormal and weakened condition of the alimentary tract.

McCarrison again illustrates the effect of faulty food (food that consists almost wholly of carbohydrates). He says: "A child's food is reduced in vitamin value in proportion to its excessive richness in carbohydrates;" and again: "It is not necessary to make a laboratory experiment to prove that if a person lives on white bread, margarin, condensed milk and tea, with a minimum of imported meat and boiled potatoes, the person is prone to suffer from such digestive disorders as dyspepsia and colonic disease, for such a diet does not contain a sufficiency of proteins to rebuild the tissues involved in digestion, assimilation and evacuation of the bowel contents;

it does not contain a sufficiency of vitamin to activate the cells of the digestive system to healthy function. It is not well balanced, and by its excessive richness in starch it favors the development in the digestive tract of fermentative organisms, and makes relatively more deficient the vitamins necessary to healthy cellular action; nor does it contain a sufficiency of vegetable residue of cellulose, waxes and vegetable salts to insure natural action in the bowels."

The sugars and starches are so rich in calorie value that the appetite is quickly satisfied and there is no demand for wholesome foods. Twenty-five hundred calories is the average requirement of the body in twenty-four hours. When we consider that a quarter of a pound of chocolate, or any of the richer candies, sugars, or sweets, contains approximately seven hundred calories —the practical requirement of the body for one meal—we readily see how the appetite is satisfied and no desire left for natural foods. If we as a nation continue to consume to excess vanilla wafers, chocolates, cakes, jellies, jams, polished rice, boiled potatoes, milled flour, and frozen meats, cereals, and soft drinks, we will soon be a nation of neurasthenics, because these foods are inert masses—dead material—that do not contain the mineral salts, vitamins and proteins that are essential to health. These are facts of dynamic value, and if we as physicians continue to ignore them disastrous consequences must follow.

This paper would not be complete without some case histories. But to give a detailed account of the treatment and all the experiments conducted in the hospital would extend this paper to a wearisome length; hence only a brief statement of facts will be given of this phase of the discussion. Practically all cases of hypertension, nephritis, rheumatism, pellagra, eczema, gastric ulcer, dysmenorrhea, urticaria, and pyorrhea have rapidly improved under the protein diet and the administration of such drugs as would promote alkaline secretion. The experiments consisted in putting these patients after recovery on a carbohydrate diet, and the withdrawal of the alkaline-promoting drugs. Every case of hypertension in which this experiment was carried out showed a steady rise in the tension. In the rheumatics it was only a short time before the pain and swelling reappeared. In the nephritics, albumin and casts appeared in from four to six weeks. In all other enumerated cases the same results were obtained. If only a few cases had been treated, and a few experiments made, the results obtained would be of little value; but the uniform success in several hundred cases, extending over a period of more than ten years, lends much value to the statement formerly made, that carbohydrate intolerance prepares the soil for the vast majority of our ills.

A word of caution: Experience has taught us that the system once intoxicated by the carbohydrates becomes sensitized to this material, and that its use after recovery, even in small quantities, will be fraught with much danger.

Chronic Carbohydrate Intolerance with Hypertension.—Mrs. A. D. C., white, American, aged sixty-five, housewife, admitted November 2, 1920. Weight 62 pounds. Blood-pressure 240. Skin dark brown; constipation, hard white stools; oral membranes, tongue and throat scarlet; proctitis, vaginitis, with excoriating acid discharge; much distress from gas after meals. No appetite. Diet had consisted for the past several years of cereals, potatoes, and rice. Passing only 8 ounces of urine in twenty-four hours; no albumin, no casts. A nervous and mental wreck.

Treatment: Thirty drops dilute nitric acid in a glass of water one hour before meals. Ten grains ox-gall after each meal. Phosphate of soda as a purgative. Trional or veronal when necessary.

Diet: Two raw eggs, four ounces pure cream, the juice of two oranges, and a pint of sweet milk three times a day. All the water she could be induced to drink.

Results: Within eight days her pressure had fallen to 140. The urinary secretion had increased to 40 ounces. We now added to the diet chicken, fish, beef, peas and beans, bean bread, and all fruits and

vegetables except beets, bananas, and melons. She was dismissed January 15, 1921, greatly improved; nervous and mental condition practically normal. Pressure 140, eating and sleeping well; normal stool every morning; weight 90 pounds. To date she is in fine condition.

Chronic Carbohydrate Intolerance and Interstitial Nephritis.—Mr. A. T. H., admitted September 13, 1918. White, American, aged sixty-one; capitalist.

This patient had had high blood-pressure and albumin for more than ten years. In New Orleans his case had been diagnosed Bright's disease and a bad prognosis given. Later in New York the same diagnosis and prognosis were made. He entered the hospital in the following condition: Blood-pressure 245, urine loaded with albumin, skin dark brown, constipation with hard white stools, exceedingly nervous, insomnia, vision greatly impaired, indigestion. Oral cavity, tongue and throat scarlet. Was voiding 14 ounces of urine in twenty-four hours. Diet had consisted largely of rice and sweets for several years.

Treatment: Thirty drops dilute nitric acid in a glass of water an hour before meals. Ten grains ox-gall after meals. Phosphate of soda when a purgative was necessary. Was induced to drink all the water possible. Trional or veronal to induce sleep.

Diet: Two raw eggs, the juice of two or three oranges, and a quart of sweet milk three times a day.

Results: By the end of the first week his condition showed improvement; urine had increased to fifty ounces. Stools were still hard and white. The second week showed soft, dark stools; blood-pressure had fallen to 175. He was now given a more liberal diet: meats, fish and game, vegetables and fruits, milk and butter. chicken and eggs, peas and beans, bean bread. The fifth week showed the following condition: blood-pressure 130, no albumin, skin clear, appetite good, sleeping well, normal stool every morning, vision practically restored. On a visit to the hospital a week ago his pressure was 138, no albumin. He states that he has worked hard the past year with no discomfort.

Chronic Carbohydrate Intolerance and Parenchymatous Nephritis.—Mrs. J. D., white, aged forty, American, housewife; admitted December, 1914.

General anasarca with the peculiar pallor of chronic parenchymatous nephritis. Ears, nose and lips cyanosed. The edema and dyspnea were very distressing symptoms. All the characteristic symptoms were present; scarlet mouth and throat, indigestion, constipation, insomnia, and urine loaded with albumin; systolic pressure 100; she was voiding 12 ounces of urine in twenty-four hours. She had recently been given every known drug that was supposed to increase urinary secretion without result. For several years her diet had consisted almost wholly of corn bread, syrup, and potatoes.

Treatment: Thirty drops dilute nitric acid in a glass of water one hour before meals. Phosphate of soda in large doses.

Diet: Two raw eggs, the juice of two or three oranges, and all the sweet milk she could be induced to drink. No salt, practically no water.

Results: In one week the edema and dyspnea had disappeared; the urinary flow had increased to 60 ounces. The patient slept prone on the bed without discomfort. She was now given chicken, beef, fish, peas and beans, bean bread, and all fruits and vegetables except beets, bananas, and melons.

At the end of the sixth week she was dismissed practically recovered; blood-pressure had risen to 140. This woman has had no return of the nephritis and is now in good health.

Chronic Carbohydrate Intolerance with Dysentery and Interstitial Nephritis.—Mr. G., white, aged fifty-six, American, capitalist, entered the hospital January 18, 1922. He had had practically all the diseases of childhood; no other illness until 1912. At this time he had an attack of dysentery that did not make a satisfactory recovery. At Mobile his case was diagnosed "Bright's" and amebic dysentery, and a pessimistic

prognosis given. During the following ten years the same diagnosis and prognosis was made in Atlanta, Baltimore, Chicago, Rochester, and New York. On entering the hospital his urine was found to contain albumin and casts; stools from six to twenty every twenty-four hours. He stated that this had been the average rate of stools for the past several years. The stools were not examined for entameba, because at all of the above places it was stated that the parasite was present in all stools examined. The diet of this patient showed that he had been a large consumer of the carbohydrates all his life, and that he had consumed them more abundantly a few years prior to his illness.

Absolute and complete rest was required, in bed most of the time. His diet consisted of orange juice, milk, and eggs—nothing more, except a little tomato soup occasionally, without salt.

The medication consisted of 20 drops of dilute nitric acid in a glass of water one hour before each meal. An occasional dose of veronal or trional to induce sleep. On the third day he had a normal molded stool (the first in ten years). In less than two weeks his urine was normal; no casts, no albumin. He was now given a more liberal diet: all meats (except fat hog meat), chicken and eggs, milk and butter, fish and game, all fruits and vegetables except beets, bananas, and melons.

He was dismissed March 6, in normal condition; no diarrhea or dysentery, no albumin or casts; gain in weight 25 pounds. Since leaving the hospital his urine has been examined by a State laboratory and found normal in every respect. He writes that so far he has had no return of symptoms.

The following statement is going to be made regardless of the fact that it opens the way for adverse criticism, especially when made in a coast city. I believe there is no such thing as amebic dysentery; that is, I do not believe that the entameba is the primary or etiologic factor. Entamebæ are the harmless guests of a large percentage of the human race — British investigation showed a large prevalence of entamebic infection in soldiers who were in perfect health. Kofoid and others found a like condition in American soldiers. I believe all pellagrins of the diarrheal type are hosts of this parasite. If such a large percentage of the people are hosts, and it is as contagious as the profession seem to believe, certainly in a decade the whole population would be sick or dead. Entamebæ attack only when the colon becomes a suitable field for operation. This condition is the result, first, of an unbalanced diet, the carbohydrates largely predominating; second, of foods that have been devitamized by every known process of manufacture. A dead, fermenting carbohydrate mass!

Chronic Carbohydrate Intolerance with Arthritis and Pellagra.—Miss I., aged forty, white, American. Admitted November 15, 1915. She had all the diseases of childhood. At seventeen years of age she suffered from diarrhea a little more than a year; following the diarrhea she suffered continuously from indigestion and constipation. In 1910 or 1911 there was developed a very severe attack of arthritis that involved practically every joint in the body. A very eminent southern surgeon thought he located the focus of infection in the colon; the appendix was removed and the colon irrigated every day for eighteen months without result. During the summer of 1915 she developed a severe attack of pellagra. For this she was referred to me for treatment. On entering the hospital she exhibited the following symptoms: Mental derangement; all the dermal symptoms of typical pellagra; sore mouth, scarlet throat and tongue, indigestion, greatly distended colon, severe vaginitis with excoriating discharge; constipation, hard white stools; insomnia; continuous dreams of the most horrible character. Arthritis with severe pain, totally helpless.

Diet: Milk, eggs, orange juice.

Medicinal: Twenty drops dilute nitric acid in a glass of water one hour before meals. Ox-gall, ten-grain doses after each meal; phosphate of soda as a purgative; veronal and trional to relieve pain and in-

duce sleep. After four weeks the improvement was marked; she was then given a diet consisting of all meats (except fat hog meat), all fruits and vegetables (except beets, bananas, and melons), chicken and eggs, milk and butter, fish and game, peas and beans, bean bread.

She was dismissed at the end of the fifteenth week in fine condition. She has had no return of any of the symptoms.

Chronic Carbohydrate Intolerance with Sterility.—In July, 1920, three ladies entered the hospital; youngest 26, next 30, the other 34. The younger lady had been married seven years without a pregnancy. The next had five children, the youngest six years old. The eldest lady had eight children, the youngest nine years old. These patients all showed sore mouth, scarlet throats, indigestion, constipation, endometritis, and vaginitis with excoriating discharge. Under the usual treatment they all made a good recovery. In less than one year from the date they left the hospital they all three bore children.

This has been the result in so many instances it cannot be a coincidence. The extreme acid secretion destroys the spermatozoa, and possibly the ovum as well; hence no pregnancies.

Chronic Carbohydrate Intolerance with Dysmenorrhea.—Miss J., aged twenty, white, American school-girl. Entered the hospital September 14, 1917. Symptoms presented were as follows: indigestion of great severity, sore mouth, scarlet tongue and throat, constipation, endometritis, vaginitis with excoriating acid discharge; insomnia, much dreaming.

Her first menstruation was accompanied by much pain and nervous shock; at every subsequent menstruation the same symptoms appeared, and as she grew older the symptoms grew in severity; a few months prior to entering the hospital each menstrual period was accompanied by severe pain and convulsions. On examination no stricture of the cervix was found.

Treatment: Dilute nitric acid, 20 drops in a glass of water one hour before meals. Phosphate of soda was employed as a purgative. Veronal or trional was freely used to produce sleep.

Diet: Milk, eggs, and orange juice.

Results: She was not conscious of the next period until the physical signs made themselves manifest; nor did subsequent periods produce the least discomfort.

She married soon after leaving the hospital and lost no time in becoming a mother.

Chronic Carbohydrate Intolerance with Acne.—Miss H., aged 19, white, American, entered the hospital October 17, 1916. This patient exhibited indigestion, sore mouth, scarlet throat, constipation, diarrhea, etc. The eruption on the face was a horrible, unsightly mass. The history of this patient's diet showed the usual preponderance of the carbohydrates; in this particular instance the percentage was above the average, about 95 per cent. Under the usual treatment the improvement was rapid; in six weeks the face showed no signs of the eruption. She writes that so long as she follows the prescribed diet there is no trouble, but that every time she fails the eruption quickly reappears.

Chronic Carbohydrate Intolerance with Urticaria.—Mr. W. J., white, aged 50, farmer, admitted September 8, 1921. He had had practically all the diseases of childhood; pneumonia and typhoid fever in his young manhood. With this exception he had been a healthy, hard-working man all his life. In the fall of 1916 he had a very severe attack of "mad itch." In a few weeks this attack was followed by another; as time passed they grew more frequent and more severe. A few months before he came to us the attacks became almost continuous, one merging into another; he entered the hospital suffering greatly. The wheals covered about one-third of the dermal surface; the skin seemed to be a half-inch thick or more. Food had given him so much distress he was almost starved. Accompanying this condition we found a scarlet oral cavity and throat, severe constipation, hard white stools, skin dark brown, insomnia, diarrhea.

The history of this man's diet showed

him to be a syrup fiend; he ate it three times daily, on his eggs and meat and in his coffee for breakfast; at dinner it served as sauce for his vegetables; at supper the same process was carried out.

Diet: In spite of his aversion to milk he was put on orange juice, milk, and eggs.

Treatment: Twenty drops dilute nitric acid in a glass of water one hour before meals. The bowels were kept freely moving with phosphate of soda. Veronal or trional was used to produce rest and sleep. The third week passed without an attack; his digestion had wonderfully improved. The sixth week showed great improvement in every respect; no reappearance of the rash.

At this time to clear up the diagnosis his diet was switched from proteins to carbohydrates—syrup, corn bread, potatoes, rice, and the cereals. Just four days of this diet produced a most serious attack. He was again placed on the proteins—meats, chicken and eggs, fish and game, peas and beans, all fruits and vegetables, except beets, bananas, and melons. In just a few days the rash disappeared to reappear no more.

The Treatment of the Gastric Symptoms in Pulmonary Tuberculosis[1]

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AND
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The occurrence of symptoms referable to the stomach in patients suffering with pulmonary tuberculosis is so common and at times so disturbing that the physician who treats many of these patients must frequently give considerable thought to the matter of their correction. The frequency of gastric symptoms has been variously stated by different writers; thus Hutchinson, among the older observers, in emphasizing the frequency of dyspepsia as an early symptom, stated that it occurred in 92 per cent of his cases, and in 55 per cent was quite severe. More recent observers give lower percentages—thus, Janowsky 35 per cent, Levison 74.6 per cent, and Landis 55.3 per cent. In our own experience we found among 1000 consecutive patients with pulmonary tuberculosis in various stages that symptoms referable to the stomach were complained of in 64.6 per cent.

In 1916[2] we undertook an investigation of the gastric function in early and advanced cases of pulmonary tuberculosis and endeavored to correlate disordered function with disease and symptoms. We used the Rehfuss tube, and by the fractional method were able to formulate certain conclusions which further observation on our part has verified. Our conclusions then are briefly as follows:

1. That active pulmonary tuberculosis causes a definite downward progression in both the motility and the secretory function of the stomach from the very beginning of the disease.

2. That hyperacidity with symptoms occurring in early stages, and described by previous writers as common, is quite rare. That even hyperacidity without symptoms is rare; the type which corresponds to the

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[2]Mohler and Funk: Gastric Function in Pulmonary Tuberculosis, *American Journal of the Medical Sciences*, 1916, cliii, 355. This article has the bibliography.

normal "hypersecretory curve" of Rehfuss, existing in 40 to 50 per cent of normal individuals (Rehfuss), exists considerably less frequently in patients with minimal tuberculosis. This would suggest that early in the course of pulmonary tuberculosis changes in gastric function are present.

3. That the so-called "pretubercular dyspepsias" of previous writers are misnamed, and that we believe they are in reality manifestations associated with definite tuberculous infection.

4. That we do not believe, on the basis of our studies, that there is an "irritative stage" giving hyperacidity in early tuberculosis. Our studies suggest that the gastric disorder is the result of disease of the gastric mucosa.

5. That there is a distinct tendency toward the formation of a definite clinical syndrome known as delayed digestion, which becomes more and more associated with symptoms as the pulmonary disease progresses.

6. That the swallowing of tuberculous sputum plays a highly important rôle in the continuation and aggravation of disordered function. No less important are the visceroptosis and gastrectasis.

With the knowledge acquired from our studies, we have endeavored to formulate a rational method of treatment. The principles of this treatment are as follows:

(1) *Diet.* The aim should be to supply an abundant amount of simple, easily digested food. Forced feeding as often practiced overtaxes the digestive apparatus, resulting in digestive disturbances which defeat the purpose for which forced feeding was instituted. Forced feeding is never practiced by us. As a rule there is less gastric disturbance among patients upon a three-meal-a-day diet with some added milk or cream than upon the straight milk and egg diet, or one in which milk and eggs predominate.

(2) *A complete evacuation of the lower bowel* daily is very important. Our attention has frequently been directed to the presence of constipation, especially in bed patients, when the clinical chart recorded one bowel movement a day. The recorded bowel movement often is only a partial bowel evacuation. The complete evacuation of the bowels is of first importance in lessening the frequency of such vague symptoms as "uncomfortable feeling in the abdomen after eating," "fulness of the stomach," "pressure from gas," etc., etc. A saline a week is necessary in most tuberculous patients with gastric symptoms. Olive oil in tabespoonful doses taken after each meal has given good results in some of our patients. Liquid petroleum has been our choice in other patients, giving from one-half to one or two ounces night and morning. One-half cake of yeast given in one-half of a glass of water has acted most efficaciously in many instances where the patient has complained of considerable gaseous distention and constipation. Finally, for a number of patients a soap-suds enema either daily or on alternate days is necessary to relieve symptoms referable to the gastrointestinal tract.

When the gastric symptoms are associated with enteritis and diarrhea there is often a reciprocal influence from the treatment of the one or the other. With the correction of the cause of the diarrhea, when that is possible, the gastric symptoms improve, and *vice versa.* Attention to the diet, the use of *B. acidophilus* tablets and milk, hydrochloric acid and the Alpine lamp may be tried.

(3) *Gastric lavage.* The gastric residuum (obtained before breakfast) is often excessive in amount and frequently contains numerous bacteria. This is especially true in the later stages of pulmonary disease. Among 24 patients with advanced pulmonary tuberculosis complaining of gastric symptoms, the morning residuum revealed mucus, bacteria and leucocytes in excessive amounts in 20 of the cases. The tubercle bacillus was present in the residuum in 18 cases. Gastric lavage daily, twice weekly, or varied as the individual case would seem to require, is a measure the value of which has not been generally appreciated. Gastric lavage, using the small stomach tube, causes but little inconve-

nience to the patient. Ordinary lukewarm water has given us good results. The lavage should be continued until the washings return clear. Nausea and vomiting are generally most effectually combated by lavage in any stage of the disease.

It has been frequently stated that normal gastric juice has some inhibitory action on bacteria. Hydrochloric acid in sufficient concentration is germicidal. In pulmonary tuberculosis, however, deficient secretion and deficient motility must militate against any such alleged protection which the stomach may exert in normal individuals. Recently Inkster and Gloyne *(British Medical Journal,* 1921, 2, 1024) have shown that gastric juice removed from the stomachs of persons free from gastrointestinal disease, at various intervals of time after an oatmeal test meal, showed very little power of destroying tubercle bacilli in sputum or in mouth-washes. In one case a total acidity of 62, in another of 54.1, and in a third of 24 failed to destroy the bacillus.

As pointed out in a recent editorial *(Journal of the American Medical Association,* 1922, lxxviii, 1053) comment upon the observations of Inkster and Gloyne, "the protection against the tubercle bacillus afforded by the gastric secretion in man is apparently by no means perfect, to say the least. Vigorous efforts should always be directed against the entry of this baneful microbe." The patient should be warned against the swallowing of infected sputum, and gastric lavage practiced.

(4) *Medicines.* When the gastric function test shows a curve of deficient secretion and decreased motility, dilute hydrochloric acid is indicated. After trying numerous methods we have come to use it as follows: Four medicine glasses, each containing an ounce of water with 5 to 10 drops of dilute hydrochloric acid, are put upon the food tray with the patient's meal. He is told to take one glass at the beginning of the meal, one five minutes later, one ten minutes later, and one at the end of the meal. In some instances the administration of dilute hydrochloric acid has given greater relief when given in 5- to 10-drop doses every twenty minutes for a two-hour period beginning immediately at the end of the meal. In very obstinate cases excellent results have been obtained by giving the patient 5 or 10 drops dilute hydrochloric acid every twenty minutes for a three-hour period beginning with the taking of food. Under this treatment appetite improves and digestive disturbance lessens. Since most advanced tuberculous patients show deficient secretion and deficient motility, this treatment is especially indicated in this group. It fails in some, especially in those few in whom hypersecretory activity is present. These patients are in the minority and seldom have symptoms. When a hypersecretory curve with symptoms is present, then antacids, *e. g.,* sodium bicarbonate, magnesium oxide, lime water, etc., are used in the same divided dosage as the hydrochloric acid. The hypersecretory type with symptoms is quite uncommon. Anorexia has been benefited by the administration of a bitter tonic, such as compound tincture of cinchona given one-half hour before meals. We have observed that a number of patients who are constantly inhaling odors of cooking foods are never very enthusiastic about the taking of food. It is well to bear this fact in mind in selecting quarters for a bed-ridden patient suffering with pulmonary tuberculosis.

With the plan outlined above, we have been able to secure a greater amount of therapeutic success than by any other plan which we have tried. We believe that its value rests upon a rational conception of the disorder of gastric function which occurs in pulmonary tuberculosis. It will fail at times, but more often will be found to be well worth the trial.

Successful Results of New Researches in Diabetes.

In an editorial on this subject, the *Lancet* of August 19, 1922, states that recently Banting and Best, working in the laboratory of McLeod in Toronto, have adopted an ingenious method of preparing the pan-

creatic extracts. It is well known that if the ducts of the pancreas are tied the acinous portion of the gland dies and is gradually replaced by fibrous tissue. The islands, on the contrary, do not seem to be affected at all by this procedure and the animal does not show any signs of diabetes. Similar effects occur when the pancreatic duct is injected with lampblack, and can also be seen in cases of chronic pancreatitis occurring in human beings. Banting and Best took advantage of this change in the following way: They tied the ducts of the pancreas of dogs, and after an interval of seven to ten weeks removed the pancreas and made an extract of the chilled gland with a neutral solution. This extract, when injected into the veins of a dog whose pancreas has been completely removed, always causes a fall in the blood sugar and a decrease in the amount of sugar excreted. The extract had to be given every four hours in order to keep the blood sugar at the normal level, and was effective only when injected intravenously, being apparently inert when given per rectum. No mention is made of its action when given by mouth. The extract can be kept in cold storage without harm for about seven days and is not affected by a weak acid solution, but an alkaline solution, boiling, or incubation with a tryptic extract destroys its action.

The action of fresh pancreatic extracts was then compared with those in which the acinous portion of the gland was atrophied. It was found that the fresh extracts also had the effect of lowering the blood sugar and diminishing the sugar output, but always caused many symptoms of toxicity in the animals and also thrombosis of the veins; and the same unpleasant effects followed injections of pancreatic extracts prepared from the pancreas of animals which had been exhausted as much as possible by secretin injections. Quite recently they have prepared a pancreatic extract from a 5-month bovine fetus, and were able therewith to keep a depancreatized dog alive for 70 days. This experimental work thus offers a convincing proof of the existence of an internal secretion coming from the islands of Langerhans and should serve to satisfy those who doubted the microscopic evidence.

The question at once arises whether these extracts of the islands can be used for the treatment of diabetes, and thus score a brilliant success such as occurred in the case of myxedema. Banting and Best, together with Collip, Campbell, and Fletcher, have already used the extract on seven cases of diabetes and report a definite improvement clinically. So far the details published have been meager and only one case is given in any detail. The extract caused a fall in the blood sugar and a decrease in the amount of sugar excreted. Although the extract was given twice a day intravenously for ten days the urine still contained sugar in amounts which varied from 7.5 to 45 g. in the day, in comparison with over 100 g. before the injections were given. The aceto-acetic acid in the urine, however, which was never large in amount, disappeared altogether. As soon as the injections ceased the blood and urine sugar increased again. Thus the results on human beings with diabetes confirm those obtained in animal experimentation. But the difficulties to be overcome before the treatment can be at all widely used must not be overlooked. The process of preparation from an animal whose duct had been tied some seven weeks earlier, and the fact that such an extract only suffices for the treatment of one completely diabetic dog for two to three days, makes its preparation in sufficiently large amounts a hard problem. Moreover, since the extract must be given intravenously two or three times a day in order to keep the blood sugar at its normal level, the wide-spread application of the treatment in its present form is not very practicable. Mere problems of technique should, however, be amenable to solution by patient effort. The authors are to be congratulated on making a first-rate contribution to the correct understanding of the pathology of diabetes which may ultimately solve the treatment of the disease.

Editorial

DOES ETHER PROTECT THE HIGHER CENTERS FROM SHOCK?

A question of deep interest to the medical profession ever since the introduction of ether as an anesthetic has been whether its employment increased or diminished the danger of shock or damage to the higher nervous centers.

It has been the custom of some anesthetists to push the ether at the most critical part of the operation, with the idea that by so doing the danger to the patient is diminished, while others have held that ether in no way blocks the pathways from the site of operation to the vital centers at the base of the brain, and, therefore, pushing the ether at the most critical time of the operation results in no diminution of shock, but adds the evil of increased ether intoxication.

Our readers will also remember that Crile and his fellow workers have repeatedly attempted to show that the administration of ether offers no protection to the brain cells against the effect of trauma, claiming that afferent impulses reach and modify the brain cells as readily as if no anesthetic had been given. Many anesthetists, while admitting that this view may be correct, have expressed doubt as to whether the evidence presented proved its correctness. Changes in brain cells were undoubtedly found, but that they were the result of the causes attributed to them has been considered doubtful.

In this connection a very important paper has recently appeared in the *American Journal of Physiology* by Forbes and Miller, who have carried out a series of experiments to determine the effect of ether anesthesia on the afferent pathways in an animal whose brain had been removed or destroyed. For those who wish to investigate this matter carefully we would advise that they peruse the full report made by these investigators. Suffice it to state that by using a decerebrated animal they were able to study the transmission of impulses along the sensory pathways and to register them by means of delicate apparatus connected with electrodes. The results which they have obtained are very definitely in contradiction to the views advanced by Crile and his followers, since they believe that ether very certainly tends to prevent an incoming stream of nerve impulses from exercising a damaging effect upon the brain. They find that light ether anesthesia, sufficient to abolish the corneal reflex, causes a diminution in the electrical disturbance occurring in the brain stem and probably arising in the second neurones in the chain leading to the cerebral cortex, and further that the blocking of impulses occurs at some of the contact points or synapses between the first and second neurones of the chain. If the ether is pushed still further they believe that there is an increase in the percentage of block points or synapses at which the block is complete, and with deep surgical anesthesia they claim that the reduction in electrical disturbance is very great, sometimes amounting almost to abolition. Expressing the matter in another way, they believe that very few nerve impulses pass the block established by ether in the first synapses, or the processes of the different neurones, and still further assert that ether is of great value in protecting the brain from such damage as may be done by sensory impulses arising from surgical procedures.

A research of this kind is noteworthy because of the skill which is necessary in the employment of very delicate technique, and because it is not only intensely interesting to the laboratory physiologist, but also of immense importance to the practical anesthetist.

Whether the evidence is sufficient to indicate that ether should be pushed at the time when the greatest damage is done by the surgeon is, we think, still a matter of debate. We confess that we have taught the

"let-up" theory with the idea that ether intoxication should not be increased at the critical moment, on the ground that ether, although benumbing the sense of pain, in no way protected the vital centers in the medulla. As we interpret this research, it indicates that some blocking occurs low enough to protect the medulla.

Further investigations along these lines will do much toward clearing up a most important point in practical medicine and surgery.

WHAT EFFECT HAVE INTRAVENOUS INJECTIONS UPON THE HEART?

At one time, if not at present, it was commonly thought by many practitioners that intravenous injections by adding to the volume of the blood stream materially increased the labor of the heart, and that this was a danger which should be carefully avoided.

This thought failed to recognize that the body has a wonderful adjustive mechanism in dealing with the circulation, pouring out into the tissues an excess of fluid when it is not needed in the blood-vessels, getting rid of it through the kidneys or even by purging through the alimentary tract. The pressure is not raised because the blood-vessels dilate as the fluid is injected, and many times the total quantity of blood may be injected without producing any change in blood-pressure due to increased bulk; indeed, it may be stated that no amount can be injected which will increase blood-pressure and thereby directly increase the labor of the heart.

An interesting study which is based collaterally upon this question has recently been made by Meeks and Eyster, who studied the effects of intravenous injections upon the diastolic size of the heart and the output of the blood. They found that an intravenous injection of saline acacia, physiological salt solution, or blood, in quantities varying from 25 to 100 per cent of the total blood volume did not increase permanently the diastolic size of the dog's heart, and by means of photomicrographs of the capillaries and venules of the ear showed that these vessels and probably the larger ones were acting as reservoirs and thus preventing a cardiac dilatation or an increase in the volume of the effective circulation.

It is true that the immediate effect of an intravenous injection was a rise in venous pressure which was associated with an increase in the diastolic size of the heart, but they evidently do not regard this as more than a temporary effect, finding that there was an increased output per beat as determined by examination with the *x*-ray.

As we have often pointed out before, it is of far greater importance to consider the quality of the fluid used in the injection, and the purity of the salts employed, than to study the exact volume which is introduced. The reaction produced by protein substances in the water or by the employment of saline solutions just above or just below nine-tenths of one per cent is far greater than the effect which is caused by larger or smaller volumes of liquid.

THE ABUSE OF CÆSAREAN SECTION.

This procedure, which before the days of antiseptic or aseptic surgery was so rarely performed as to be a clinical curiosity, has within recent years become quite a common operation, and the type of case in which it has been employed has varied materially from the type in which it was originally used, so that at present there is a tendency to resort to it earlier than heretofore, with the result that in some instances the procedure cannot be defended as being absolutely necessary.

It is true that a great deal of good has been done by its performance on the part of one who is a skilful operator as well as a competent obstetrician. Nevertheless complications do arise, and in some instances the question has to be determined as to whether the chances of the patient are not

better if she is left alone than if operated on.

An important paper dealing with this subject has recently been published in the *New York State Journal of Medicine* by Normandie of Boston. He points out that some people seem to think that all breech presentations, all right posterior or left posterior positions, all placenta prævias and all eclamptics demand Cæsarean section, and he then adds that while he agrees with the proposition that these conditions should be sometimes so managed, he strongly protests against this being considered the method for all cases. So, too, he points out that occasionally a patient starts up indifferent contractions, which last for twelve hours or more, but no dilatation takes place, and the physician jumps to the conclusion that there is present a first-stage inertia and recommends an abdominal section, whereas had he exercised better judgment he would have known that the patient is not in true labor at all and that had he given a little chloral and morphine to quiet the woman, normal labor with normal dilatation of the cervix would ensue a few days later and a natural delivery take place.

Then there is the type of patient which stands labor poorly and has a history of previous labors having been followed by a miserable convalescence. Some operations have been done in this class that seem to be unjustified, since if the patient is properly handled and helped by pain relievers such as nitrous oxide gas and oxygen, none of the dreaded difficulties are met with.

Another very important point which is emphasized by Normandie is that it is not so much the skill of the operator in the technique of the operation as it is his skill in exercising judgment as to when it should be done.

In connection with the use of Cæsarean section in eclamptic patients, Normandie expresses the belief, which is, of course, universally held, that this operation is not suitable for all cases, but on the other hand he states that where the patient is definitely toxic, where efficient treatment has been given, and no improvement, or very little, has followed, and where in addition the cervix is long and not taken up, then Cæsarean section gives brilliant results. But again he emphasizes that proper supervision and care of the patient will in many instances put aside the necessity for the operation.

In regard to the wisdom of resorting to Cæsarean section in the presence of placenta prævia, he points out that certain definite conditions must be present if it is resorted to. The patient must be in good condition and uninfected, the cervix must be rigid, the os undilated, the fetus alive and viable.

Then a word must be said in regard to this operation in connection with cardiac cases, many of whom have very easy labors and can be readily helped by modern methods. In the majority of these patients Normandie believes that ordinary delivery is by far the best procedure.

Last of all he deals with those enthusiastic operators who point out that Cæsarean section is a method of making childbirth painless. We think that very few of our readers would consider that the gravity of this procedure justifies the avoidance of pain even if pain and discomfort were really put aside. Furthermore, the danger of opening the abdominal cavity or some failure in aseptic technique may result fatally. Emboli may do damage or cause death, distention or intestinal obstruction may ensue, and then, too, the question of future pregnancies in relation to the damage done by the operation is a factor not to be ignored.

It is interesting in this connection to note that Holland in England, in analyzing a great number of Cæsarean sections, has found that the frequency of rupture of the uterus in future pregnancies is 4 per cent. For this reason Normandie believes that the Cæsarean section is possibly the safest method for a woman who has been so delivered on a previous occasion. If it is not done the patient must be put where a competent obstetrician is present at all times during the labor to meet any possible emergency.

As illustrative of the popularity of this

procedure with some obstetricians and its unpopularity with others Normandie concludes his paper by stating that in one hospital in Massachusetts the frequency of Cæsarean section was three-tenths of one per cent, while in another it was eighteen per cent, which he takes as an indication that some obstetricians or surgeons are performing Cæsarean section whenever they want to. It is manifest that here as in other medical problems skill and judgment should control the medical attendant rather than operative enthusiasm.

THE IMPORTANCE OF THE LIVER AS A STOREHOUSE OF GLYCOGEN OR GLUCOSE.

While for many years attention was centered upon that function of the liver which is connected with the secretion of bile, which in turn acts as an intestinal antiseptic or digestive agent, it has been known for a long period that this gland was most efficient in the destruction of poisons developed in the body and any organic poisons which might be ingested. It has also been known for many years that the liver, with the muscles, is the area in which glucose is stored in order that it may be supplied to the body whenever needed, and particularly when severe exertion results in its rapid consumption.

Many years ago Charcot pointed out that in certain conditions of advanced cirrhosis a condition of stupor or coma developed, which has been called "hepatic coma," and which is not rarely seen by the clinicians in cases of advanced cirrhosis after repeated tappings for abdominal fluid. The cause of this coma or stupor has not been clearly understood. It is thought by some that it depended upon the inability of the liver to destroy poisons, which therefore were competent to produce a very toxic effect, and in one sense this view may still be correct, at least in part, but recent researches, notably those which have been carried out by Mann and Magath, emphasize the importance of the storage of glucose in the liver so far as vital functions are concerned and indicate that possibly "hepatic coma" so-called is due to such advanced disease of the liver that its ability to store glucose is largely put aside.

It is not necessary in this note to detail the various precautions which were carried out by these investigators in order that their results might be accurate. Suffice it to state that they estimated the blood sugar of dogs before operation as well as after operation, surrounding their work with all the points in physiological chemistry which seem to be necessary to give it adequate control. By a method of surgical technique, which we need not describe, they were able to totally extirpate the liver, and under these circumstances a train of symptoms speedily developed which were characterized by the animal passing into a deep coma with completely flaccid muscles, the diaphragm being the only one which preserved its function for a time, and later the animal developed convulsions which were quickly followed by death. If, however, they supplied the animal with glucose in the proportion of 0.25 to 0.5 gramme for each kilogramme of body weight, the dog, although in a condition of complete coma and flaccidity, was able to stand on its feet within thirty seconds after an intravenous injection, to walk about, to respond to call, to wag the tail, and drink water so that in one minute after the injection apparently all the symptoms which were so severe had disappeared.

Furthermore, they state that this restoration to normal is usually possible even when the animal seems practically dead, provided the heart has not actually stopped, although respirations may have failed.

By estimating the blood sugar of the animal they found that immediately after injection it reaches a high level, then falls quickly for a time, and then more gradually decreases, and then if its level again approximates the low average found before the injection was given the symptoms

which we have described recur. Furthermore, as they recur, repeated injections resuscitate each time, although after a number of such treatments the time during which the animal remains resuscitated becomes shorter and, it is interesting to note, the symptoms reappear when blood analyses show that the blood sugar is higher than it was when symptoms developed on previous occasions.

Not satisfied with these results, these investigators went further and endeavored to find out what the effect would be of administering glucose by continuous intravenous injection, and by giving it through the alimentary tract, and by intraperitoneal injection, the idea being, of course, to maintain a high blood sugar content. Under these circumstances coma and flaccidity of the muscles did not develop, but in twenty-four hours, or less, convulsions ensued and death took place.

When fairly free doses of glucose were administered by the mouth, as soon as an animal recovered from the immediate effects of the operation of removing the liver, the glucose was absorbed by the stomach with sufficient rapidity to prevent the onset of the primary symptoms, although ultimately, about a day and a half after operation, the animal died in convulsions.

It is also of interest to note that certain substances which might be supposed to be useful substitutes for glucose fail to exercise its beneficent effect; thus saccharose, lactose, levulose, and the various salts of sodium, alcohol, and other agents, seem to have no restorative action whatever, but maltose, mannose, dextrin and galactose did act favorably, although apparently not so well as glucose. Indeed galactose is so feeble as to be practically useless. Maltose gave the best results.

The operation of hepatectomy results in a rapid pulse which slows markedly as soon as the blood sugar falls, and the pulse becomes irregular as the other symptoms develop, but becomes more normal on the injection of glucose. The electrocardiograph, however, fails to show that there is any definite change in cardiac function which can be recorded by this instrument of precision either before or after the glucose injection.

Mann and Magath have not carried their investigations far enough to make them willing to dogmatize in regard to their clinical bearing, but they do point out one fact which seems to us of very great importance to the general practitioner, who in these days is considerably influenced by the theories which have been advanced in regard to alkalosis and acidosis.

The thought having arisen that the removal of the liver might have resulted in either one of these conditions led them to investigate this point, but they were never able to discover sufficient blood changes to justify them in believing either alkalosis or acidosis was present, and furthermore the injection of acids or alkalies served only to make the condition worse. Again, the thought that glucose might produce good effects by raising the osmosis between the blood stream and the tissues is negatived, because producing such a physical condition by hypertonic solutions of other substances gives no relief.

From the standpoint of the general practitioner this research seems to indicate that the frequent employment of sodium bicarbonate in the treatment of so-called acidosis, which in many cases does not really exist, is not only useless, but possibly may be harmful, and that the employment of glucose, whether it be by rectum, intraperitoneally, by the stomach, or intravenously, has far greater basis for its employment.

Researches of this character, which for the moment do not seem to greatly increase our therapeutic possibilities, nevertheless point the way toward a great increase in knowledge in a very important field, and their practical bearing and scientific interest will doubtless lead these investigators, and others, to continue their work with the strong probability that a very considerable addition to practical therapeutics may be developed.

CONTINUOUS TREATMENT IN SURGICAL TUBERCULOSIS.

Probably no surgeon, nor physician either, for that matter, who has received his training within the last ten years and at a first-grade medical school, passes on the street a crooked back, or a distorted and useless leg, without thinking that this crippling or deformity might have been prevented had the modern concepts of the internist and the orthopedist been known to the professional man to whom these cases in childhood originally went for help. Even yet, in the treatment of chronic infections and particularly those involving joints and bones, the factor of time as an element of cure and the need for much time is not fully understood. In this relation Goyder (*British Medical Journal*, June 10, 1922) quotes with some enthusiasm Jones, Gawvain, Calve, Calot and others to the effect that treatment properly directed in the first place and continuously and patiently applied for months, or even years, may and does accomplish what would have been regarded as impossible even a half generation back. These surgeons have shown that operation is often not needful, that if it be required it is but the beginning of a long-continued and persistent treatment, and that this after-treatment is often far more important than the surgical procedure.

It is well recognized that the complete eradication of a tuberculous focus, if it be possible without entailing permanent damage to important structures, is the ideal method of procedure; that even though the lesions be multiple the clean excision of a dominant one may favorably affect the general health. It is also recognized that this complete eradication is often impossible either because the disease is too widely spead, or because the tissue damage incident to such procedure would in itself be crippling. When complete eradication is impossible, or in the case of multiple lesions after a major one has been extirpated, rest, protection against trauma, and all measures which tend to betterment of the general health are indicated, and for a period of time much greater than is possible in general hospitals to which these patients are usually sent.

Goyder notes that in Bradford there are accommodations for about 200 children in their cripple school; that nearly half of these 200 children represent cases of surgical tuberculosis. When the disease is active these children are treated by splints, traction, fixation, plaster casts, recumbency, and various methods which the author has found useful when systematically continued and supervised.

When such children require surgical intervention, or change of casting, or splinting, they are transferred to a hospital which works in conjunction with the school. If no such treatment be required children are allowed to spend their week-ends at home, providing conditions there are suitable. Goyder states that in this way he has kept cases of spinal and hip caries under treatment for two years without interrupting their education. He urges that a method such as this is both efficient and economical, and rightly argues that the latter is sequential on the former.

As a result of the hospital and school working together, children who are not strictly speaking ill, but who are undergoing local changes which would ultimately prove crippling, if unchecked, or even destructive of health and life, are enabled to keep up with those of their age in scholastic or mental training work, and are turned back to the community fitted to fill a useful place in life. Both ambulant and bedridden patients are cared for in the same school. Thus, under the supervision of the same surgeons the treatment, lasting at times for years, is logically and effectively sequential, nor is there any sense of hurry, since these children's mental development is being cared for.

THE COLON.

From the surgical standpoint the gastrointestinal tract has one function, propulsion. When there is stoppage from any cause, spasmodic or mechanical, functional or organic, trouble begins. If the stoppage be

intermittent in nature or slow in development, there develops first a muscular hypertrophy, to be followed, if stoppage be long continued and progressive, by atrophy and dilatation. As a result of stoppage, if this be in any part of the intestinal tract, there is fermentation and absorption, often of lethal nature. The symptoms of absorption from the intestinal tract are expressed in the form of a multitude of degenerative lesions which may affect any organ of the body. Even as the throat man inveighs against the tonsil and adenoids as the root of all evil, and the dentist holds that from the gums come all the ills from which man suffers, so the internist is coming more and more to regard the intestinal tract as a focus from which are derived the toxic or bacterial agents which cause vascular, nervous, muscular, osseous, and arthritic terminal changes.

The colon is strikingly contrasted to the small intestine; instead of being in a condition of constant motion it is mainly quiescent, becoming active only during or after meals. Hurst *(British Medical Journal,* June 17, 1922) notes that what Holzknecht calls "mass peristalsis" is practically the only movement of importance observed in the colon. This movement occurs a few times during the day and carries with it all the contents of the bowel. After the soluble material and most of the water have been absorbed from the intestinal contents, the latter are propelled by the mass peristalsis from the cecum and ascending colon to the pelvic colon, where they remain until the first peristaltic wave occurs, usually in the morning, either as a result of the stimulus of getting up and dressing, or of taking breakfast: they are then carried into the previously empty rectum, where they cause a desire for defecation.

Concerning the radiology of the colon, Hurst points out the wide range of normal variations in position and activity. He notes the case of an absolutely healthy athlete whose greater curvature lay two inches below the umbilicus and whose transverse colon reached almost to the bottom of the pelvis.

Colonic ptosis in itself need not give rise to symptoms.

As to membranous colitis, this term is inaccurate. The casts really represent the secretion of mucus incident to irritation, this mucus becoming coagulated by a process not dissimilar to the manner in which fibrinogen forms fibrin in the coagulation of the blood. If there be pain associated with this secretion it is due to spasm. The presence of mucus itself, unless found mingled with soft stools, and no aperient has been taken, is not necessarily indicative of any inflammation. The presence of pus, however, is always of import. The proper diagnosis of inflammatory conditions of the sigmoid and rectum is dependent upon the skilled use of the sigmoidoscope. The author observes that about $10,000,000 was expended in 1921 on patent medicine, the basis of most of which was a purgative.

Concerning these purgatives he points out that toxic absorption is encouraged by making the bowel content fluid; indeed, he has had symptoms entirely disappear as the result of no other treatment than giving up purgatives.

Concerning intestinal lavage the author quotes Pliny to the effect that the Egyptians learned the value of enemata by observing the ibis: "He washes the inside of his body by introducing water with his beak into the channel, by which our health demands that the residue of our food should leave."

"It is cruel to deprive the ibis of his claim to this epoch-making discovery, but the truth must be told: the ibis does not give himself a Plombières douche, but after washing his beak in water he oils it in his preen-gland, which is situated near the anus, in preparation for preening his feathers."

The author states that Louis XIV. received several thousand enemas, and that the last few years have noted a revival of enthusiasm for the method. He regards the intestinal lavage as useful to remove retained feces, also serviceable in some forms of inflammation of the colon, the silver salts proving most valuable for this purpose. He calls attention to the fact that it is impossible to pass a soft-rubber tube

more than four to six inches, and the introduction of a foot or more of tube simply acts as an irritant to the rectum. He would limit the introduction of the tube to two inches and the pressure of the fluid to not more than twelve inches of water, and the quantity to not more than a pint and a half. This quantity has been shown always to reach the cecum regardless of the position the patient may take. The knee-elbow position is, however, the one to be preferred.

As to the surgical indications, he regards them as few and far between, if cancer and diverticulitis be excepted. Appendicostomy and cecostomy have been displaced by the serum treatment for the cure of dysenteric lesions. In a large experience he has only recommended surgical operation for stasis in five cases. One patient died, one was cured, and the other three were somewhat benefited.

As to colectomy, he states that he has come across an occasional brilliant result, but he believes that the patient is often no better and even worse than he was before operation. There were 40 colectomies in 1914 at Guy's Hospital, only one in 1920, and not one in 1921.

As laxatives the author evidently prefers senna and paraffin oil.

This is a sound paper based on a large experience, and has for its object the encouragement of those who believe that the colon if properly cared for may be distinctly usful, and even if improperly cared for may be restored at least to such a degree of usefulness as not to justify a major operation for its removal.

Progress in Therapeutics

Medical Therapeutics

Toxic Effects of Arsenobenzol Preparations.

In the report by the Salvarsan Committee which appears in the *British Medical Journal* of July 29, 1922, it is stated that the chief statistics available have been those obtained from military hospitals, as, for various reasons, less reliance can be placed on the records of civil venereal clinics. As a result of its investigations the committee has arrived at the conclusion that no special arsenobenzol preparation must be regarded as more likely than another to produce ill effects. Moreover, when accidents have occurred errors in technique in administration have seldom been found to be responsible. There have been fatalities even under the most careful control, and in large and well-equipped hospitals.

The most important ill effects which may end fatally were found to be encephalitis hemorrhagica, acute yellow atrophy of the liver, and exfoliative dermatitis and its complications. Encephalitis hemorrhagica usually occurs within two or three days after an injection, and most frequently after the second injection of the series. Disorders of the liver provide a very large number of the ill effects following arsenobenzol treatment, and may occur as an early jaundice or as a late and more dangerous lesion. The pathology of the latter lesion is still in some doubt, and it has even been suggested, especially in Germany, that it is not directly due to arsenobenzol. Skin reactions following salvarsan are fairly common, but fortunately they are light and transient as a rule, the only reaction or lesion of serious significance being exfoliative dermatitis. There exist certain other ill effects which may end fatally, but fortunately these are but rarely encountered; they include acute renal damage, ulcerative enteritis, polyneuritis, and aplastic anemia.

Some of the ill effects which are recognized as being due to salvarsan may without

hesitation be ascribed to the arsenic which it contains. The lesions capable of such explanation are gastritis, enteritis, and exfoliative dermatitis. The so-called "crises nitritoides," vasomotor phenomena, and liver lesions are, on the other hand, probably produced by arsenobenzol poisoning rather than by arsenic. An interesting point in connection with the latter is the observation that cases of severe jaundice and liver atrophy appear to have occurred in the form of small outbreaks localized to one or another hospital, and restricted in time to a few months of its practice. This fact has led certain observers to suggest that these liver lesions are not directly due to poisoning but are caused by an intercurrent microbic infection of the liver. The committee does not, however, favor this view.

Before stating its conclusions as to the relation of arsenobenzol compounds to the occurrence of jaundice and acute yellow atrophy of the liver, the committee has made an exhaustive study of the literature and the experimental work on the subject. A brief examination of this is sufficient to show that a great diversity of opinion still exists as to the pathology of the condition, many observers believing strongly that salvarsan is not responsible for the condition. It is, however, impossible to get over the fact that before salvarsan came into general use in the treatment of syphilis comparatively few cases of jaundice were encountered. It is difficult therefore to accept the view that the spirochete rather than the salvarsan is responsible for the hepatic lesions. For the view that it may be produced by an infective cholangitis arising from the intestine there would appear to be more foundation. This supposition relies for support on the bacteriological findings of Stuart Macdonald and Fraenkel, who claim to have found organisms in the hepatic tissues of fatal cases. It is obvious, however, that little reliance can be placed on bacteriological examinations carried out after death and unsupported by blood cultures made during life.

But quite apart from the results of morbid histology, evidence is gradually accumulating that a course of arsenobenzol treatment is followed in practically every instance by a certain degree of hepatic insufficiency, not enough to give rise to active symptoms, but capable of recognition by means of special tests. Such tests have been carried out at St. Bartholomew's Hospital by Mackenzie Wallis, and by Spence and Brett elsewhere. For this purpose two tests have been employed—namely, levulose toleration tests and the estimation of the lipase or fat-splitting ferment normally present in the blood. The main results obtained so far by Mackenzie Wallis may be summarized as follows: (1) The effects of one or two injections of arsenobenzol preparations are almost always very slight, and little evidence of hepatic damage may be found at the end of a course of six injections. (2) The most striking results are obtained when the tests are applied three months after the last injection. Evidence of hepatic insufficiency is then detected almost invariably, although no clinical signs of hepatic disorder may be discovered. Six months after the last injection all evidence of hepatic insufficiency has gone, in cases in which three months before it was clearly in evidence. It is obvious that the importance of these findings, if widely confirmed, may be very great in connection with the safe spacing out of courses or arsenobenzol treatment.

Whilst recognizing the importance of exercising great care in the administration of "606" and "914," the committee is completely in accord in expressing the view that arsenobenzol preparations are more efficacious than any other drug yet available for the cure of syphilis:

"Although it is true that even this preparation cannot be guaranteed to effect an absolute cure, except in the early stages of the disease, it is now well established that a considerably larger proportion of cures can be effected by salvarsan and its allies than by any other form of treatment."

The committee's report ends with the following conclusions:

"It is believed that the very small number of unavoidable deaths due to this treatment are immeasurably outweighed by the deaths and disabilities which would arise if the older methods of treating syphilis were alone practiced. At the same time the facts which have been brought together in this report no less strongly emphasize the importance of the most scrupulous care in the administration of a drug which is necessarily employed in doses not far removed from the danger line."

A Study of 443 Cases of Hereditary Syphilis, with Especial Reference to Results of Treatment.

WHITE and VEEDE, in the *American Journal of Syphilis* for July, 1922, state that their study was undertaken with the purpose in view of determining whether or not the end-results of the intensive work with hereditary syphilis during the period of 1912-1920 were of such a nature that future work along the same line was indicated or justified. During this period 443 patients with the disease were observed and followed with adequate hospital, clinic, and social service facilities available at all times. It is impossible to state the exact cost, but when the time and salaries of physicians and social workers, equipment, drugs, etc., are considered we are justified in estimating it at many thousands of dollars.

From the social standpoint they found the group as a whole unsatisfactory and difficult to deal with. Lack of interest on the part of parents has led a large part of their material to discontinue treatment long before dismissal by the physician. While here and there families have been encountered who have coöperated most satisfactorily, their number is far overshadowed by the group of uncoöperative. Thus, out of 230 living patients in whom end-results are known, only 52 followed out a thorough course of treatment; while 95 were absolutely uncoöperative. A middle group of 83 cases continued treatment with a fair degree of regularity for a time, but dropped away before discharged. Allowing for the 78 deaths in the group, there are still left 125 patients who for one reason or another were lost track of, and a large percentage must be included with the group of "uncoöperative." In their experience, in spite of thorough and intensive follow-up work, only a third of the hereditary syphilitic patients were given the benefit of a satisfactory or fairly satisfactory course of treatment, and they question whether this figure can be improved under ordinary conditions.

In discussing the results of medical treatment two view-points must be considered: first, the results of treatment in the individual case of hereditary syphilis; and secondly, the results of treatment for the group of 443 cases as a whole. So far as the individual case is concerned their results show that a given case has a fair chance of clinical and serological recovery or improvement; that such recovery or improvement may seemingly take place on little or practically no treatment, but that the chances for cure or improvement are very much better for a case thoroughly treated with arsenicals and mercury than for one poorly treated. The earlier the treatment is started the better the result. If the given case has either serological or clinical evidence of involvement of the central nervous system, the chances for recovery or improvement are poor. One is justified, therefore, in treating a case of hereditary syphilis thoroughly with the expectation that it will be benefited.

As regards the group as a whole the results have been disappointing. The infant mortality rate is three times the rate for infants from all diseases. This is despite treatment, and is seemingly dependent upon the extent to which the infant's nutrition and metabolic function have been impaired. Further, approximately one-third of the cases have had involvement of the central nervous system, and as a group these have shown little improvement. Although active lesions in these cases have been checked, the residue of the infection leaves a child who as a rule belongs to the socially unfit. Considering the group of

308 cases whose end-results are known they find them briefly as follows: Cured or recovered 67, or 22 per cent; improved 108, or 35 per cent; unimproved 55, or 17 per cent; died 78, or 25 per cent. Thus they find that in their entire group, regardless of the amount of treatment received, 43 per cent were either unimproved or died. Despite the intensive work during this period only 22 per cent of their cases are known to have been cured or recovered.

Certainly this cannot be considered a brilliant showing. While one is justified in urging thorough treatment in the individual case, their group results clearly show that from a social or group standpoint the treatment of hereditary syphilis in the infant or child leaves much to be desired. The problem is best attacked by reaching the syphilitic woman or mother before and during pregnancy. This is all the more apparent when one takes into consideration the fetal mortality. While by no means advocating the neglect of the syphilitic child, they feel that the results to be obtained are so poor as a whole that our efforts should be directed much more to the prenatal clinic than to the pediatric clinic, and that the only satisfactory solution of the problem of hereditary syphilis is its prevention rather than its cure.

Night Sweats: Their Significance and Prevention.

In the *Lancet* of July 29, 1922, PATERSON states that no medical man without practical experience of slumber sweats can appreciate what a terrible thing it is to suffer from them. He has treated hundreds of cases, but did not realize this himself until some few years ago the micrococcus melitensis took possession of his body; he then endured agonies from such sweats, so that he did everything he could to refrain from slumber—of course, without avail—and he would waken even after a brief sleep absolutely wet through. Under such circumstances, it can be readily understood, his brain was not functioning at its best; but he did observe that the reason one sweated was because one lay still with one part of the body in contact for a long period with the mattress, and it was this that acted as a compress or poultice. This idea brought back to his memory the many tropical nights, spent in the service of the P. & O. Company, when he had slept in comfort on a grass mat over the mattress, and under the sheet. Fortunately he had one, and from the moment it was arranged on his bed the sweats disappeared.

When a person is awake and there is a feeling of heat and sweating around any part of the body in contact with his bed, he moves on to another part of his body automatically, and so does not break out into a profuse sweat, because he is frequently moving. When he falls asleep one part of the body remains in contact with the bed, because he is immobile, and so the slumber sweat is produced. He has now at one institution, where there are many severe cases of slumber sweats, been using similar mats for many months, and the results fully confirm his own personal experience. The only case in which after several nights' use he has known a mat to fail to cure the sweating was relieved by taking away the mattress and placing the patient on a piece of canvas stretched between the head and foot of the bed. Whatever, therefore, be the factor in the body that makes a slumber sweat possible, the actual production is the mechanical contact of the body with the mattress. To understand this, it is only necessary to sleep on a mat during a hot night, when all the heat and discomfort caused by a mattress will disappear.

To consider the factor in the body that causes these sweats, the primary stimulus to the "sweat center" is obviously insufficient "loss of heat," and this has been shown by Leonard Hill to be rectified by movement of air. Hence the opening of windows to diminish slumber sweats and the mats permit of the insulation of the body from the mattress which conserves the heat. The sweats may, therefore, be due to the toxins in the blood after an auto-

inoculation stimulating the sympathetic, which is shown by Langley to be so closely associated with the sweat glands, and so causing the sweats; the sequence of events being as follows: (1) patient lying still in bed because of toxemia and feeling "rotten," and consequential deficient aeration of body; (2) heat loss therefore small; (3) smaller loss of toxin, because sweat evaporation is less than usual; (4) accumulation of toxin in body; and (5) stimulation of sympathetic and causation of excessive sweats. This theory supports the view, already enunciated, as to why sweats do not occur in all cases in which bacteria and their products are present in the bloodstream. The sweats only occur when there is a great amount of toxin in the blood. Obviously the more the toxin the quieter the patient.

Many imported mats have patterns worked on them; these kinds should be avoided because they leave a pattern on the skin and so cause discomfort. It should not be overlooked that these mats are chiefly used when a patient is in an advanced state of tuberculosis, and is very thin, and his skin very sensitive and liable to bedsores, so that the grass or straw must be fine. Probably a panama straw mat would be the ideal article for any one who objects to the "hardness" of a Japanese mat. Patients sometimes disapprove of the mats at first because they feel hard; if such a criticism is raised, the mattress is often at fault. It should, therefore, be seen to, before ordering a mat, that the patient has a comfortable mattress. Once a patient is at ease on a mat it gives him relief almost at once. Mats will not prevent sweats if the patient is over-clothed either by personal or bedclothes, and before its use these matters should be gone into in detail. Neither will mats stop the sweats caused by the contact of the neck and head with the pillow; but these are not what is meant by slumber sweats.

He summarizes his article as follows:

1. Night sweats should be called slumber sweats, as they do not occur except when a person sleeps.

2. In the early stages of pulmonary tuberculosis, and in the absence of any other infection, they are often the one indication of active tuberculosis.

3. Slumber sweats cease some weeks before death, because the patient's resistance has been overcome.

4. Slumber sweats can in nearly all cases be prevented without drugs by sleeping on a grass mat over the mattress.

5. Sleeping without a mattress on canvas will stop sweats.

6. The sweats are due to the presence of bacterial products (toxins) in the blood (in large quantities); they can therefore occur in any bacterial disease, and are not in consequence in any way diagnostic of pulmonary tuberculosis.

Intravenous Quinine in Malaria.

MUKARJI, in the *Indian Medical Gazette* for July, 1922, states that in submitting this note for publication his object is to show by illustrative cases that this is the most convenient and rapid method of destroying the malarial parasites in the blood and thus bringing about a cure. The quinine that is administred by mouth, by rectum and by intramuscular injections is not wholly absorbed and the results in severe cases are disappointing. The intramuscular method is very painful, and in careless hands is attended with a grave risk of tetanus and also of abscess formation. He has used the bihydrochloride of quinine in 5- to 10-grain doses dissolved in 20 cc of sterile water. From his own experience he says that this is safe and a larger dilution is not essential. The technique of the operation is simple. A 20-cc serum syringe is carefully sterilized by boiling. The patient is made to lie down on a bed, the bend of the elbow is carefully washed with soap and water, dried, and painted with rectified spirit (tincture of iodine blurs the outline of the veins). A piece of india-rubber tubing is tied around the arm and kept in position by an artery forceps to make the veins prominent, and the patient is instructed to work his fingers

with the same object. The operator takes the syringe filled with the quinine solution in his right hand, and with the thumb of his left hand pressed on the vein to steady it, the needle, held almost flat with the skin surface, is boldly thrust through the skin into the vein, preferably the median basilic. The successful entrance into the vein is indicated by a flow of blood into the barrel of the syringe, when the ligature in the arm is taken off and the solution is slowly injected into the vein. At the completion of the operation, a sterile pad is placed over the site of puncture and is secured by a few turns of a bandage. The only symptom complained of by the patient is a sensation of giddiness and heat in the brain, which soon passes off.

In cerebral malaria, in comatose, delirious and hyperpyrexial forms where no time should be lost in bringing the system quickly under the influence of quinine, this should be the method of choice. It is not so risky an operation as it is supposed to be, and practitioners should resort to this method more freely. It is far more safe and far less painful than the intramuscular injection of quinine, while it gives the best results in the shortest possible time. The age incidence varied from three to fifty years in a total of more than 200 individual cases treated by this method.

Some Aspects of Auricular Fibrillation.

In the *British Medical Journal* of July 22, 1922, HAY states that when fibrillation is present the primary object of treatment is to reduce the ventricular contractions to a number within normal limits. In the most urgent cases of all, when the condition of the patient is so grave that it is obvious that unless the heart is slowed down at once death within a few hours is inevitable, strophanthin must then be administered intravenously in a dose varying from 0.5 to 1 mg. The result is sometimes as satisfactory as it is dramatic. Within an hour the condition of the patient is altered from one of acute distress to relative comfort; a liver obviously engorged and pulsating has shrunk materially; the cardiac thrust has moved in toward the nipple; the breathing is easier and the heart-rate has fallen to a normal frequency.

In less urgent cases full dosage with the tincture of digitalis will probably be adequate: 3j or 3jss of the tincture as an initial dose, preceded by a purge, will generally give some relief within twenty-four hours; or the tincture may be prescribed in 20-minim doses three or four times in the twenty-four hours.

The digitalis group acts mainly by depressing the junctional tissues and hindering the passage of stimuli from the auricle to the ventricle. Digitalis should be continued until a specific response has been obtained; when the ventricular rate is down to 70 or 80, then the dose must be reduced until just sufficient is taken to maintain this speed. The most satisfactory response undoubtedly occurs in the rheumatic group. The danger is that the patient may cease to take digitalis when the symptoms have disappeared, or, as it often happens, the doctor in charge discontinues the administration for fear of the so-called cumulative effects. The result is that within a few weeks the ventricular rate mounts and the dyspnea and other indications of cardiac distress return. Certain patients are dependent on the help to be obtained from digitalis, and must never entirely cease to take it in appropriate doses, for digitalis is essential to their well-being.

There are, of course, well-recognized indications for diminishing or stopping digitalis, such as: (1) a ventricular rate of 70 or under; (2) nausea or vomiting or diarrhea; (3) a "coupled beat" which has appeared as the result of treatment with digitalis. This coupling is a specific response; it is an indication of saturation and that digitalis should be stopped. The nausea and vomiting may be a true indication of toxic dosage, or merely the outcome of the resentment of an engorged stomach to a nauseous drug. If there is reason to believe that the latter is the case, then the digitalis should be continued, but given well

diluted or in a bland bismuth draught. When the tincture is badly tolerated the patient can sometimes take with comfort either Nativelle's digitalin granules or the tincture of strophanthus.

In the mildest cases of all, with only a moderate acceleration of the ventricular rate and no distress, regulation of the life and the exhibition of mild hematinics over a long period yield the best result. There are few better cardiac tonics than an adequate supply of good blood to the heart through the coronaries. This is especially applicable to the cases of fibrillation occurring in patients with high blood-pressure and arteriosclerosis.

Sometimes fibrillation ceases spontaneously and may never recur; more often it is permanent. Recently much has been written about the action of quinidine sulphate and its power of terminating fibrillation, and it is of interest to refer to this line of treatment.

Hay's experience covers 17 cases in which he has given quinidine with the object of restoring a normal rhythm. In 6 of the 17 the treatment failed. Either the patient could not tolerate the drug or the cardiac failure was accentuated by the quinidine. In 11 of the 17 a normal rhythm was obtained, but two of these relapsed and persisted in their fibrillation. Ultimately in 9 of the 17 patients the normal rhythm was maintained. It is possible if not probable that as time goes on some of these nine may fall from grace. On resumption of the normal rhythm some patients feel materially improved; others do not admit to much, if any, benefit.

In his opinion the treatment is not free from danger, and the action of the quinidine should be most carefully checked. His practice is to have an electrocardiogram taken twice a day and the changes in the auricular and ventricular contractions noted. He gives the drug in capsules in doses of 0.2 gramme spread over the twenty-four hours, so that the patient receives ten doses, or 0.2 gramme, a day. Its indiscriminate use is dangerous, and it should only be given in carefully chosen cases and with the patient under continuous observation. He lays emphasis on this because he has met several instances where, through ignorance, quinidine sulphate has been prescribed recklessly and without any attempt at adequate supervision.

The Nature and Diagnostic Significance of the Syndrome of Adrenal Insufficiency.

WRIGHT, in *Endocrinology* for July, 1922, states that modern experimental work has shown that the tonus theory of adrenal function must be abandoned. The evidence is to be found fully discussed in the papers of Vincent and Stewart, Sergent himself in a recent communication acknowledges that the normal blood-pressure is not maintained by adrenin, and presumably he would be prepared to modify his original explanation of the mechanism of the production of the white line. It has been shown that the white line is a capillary, not an arteriole, phenomenon, and there is no available proof that adrenin has any action on the capillaries. The investigation on 100 healthy men demonstrated that the line is a physiological occurrence. This view is supported by the work of the other authors who have been quoted.

Since the foregoing was written Wright says that his attention has been drawn to a paper by Kay and Brock, who have investigated the clinical significance of the white line. They agree that the response bears no relation to adrenal gland activity. They find it frequently present in normal subjects (especially young adults), and it bears no relation to the blood-pressure. It can be made to appear in the face of an injection of adrenalin given subcutaneously. These authors do not discuss the exact physiological mechanism of the response, but appear to regard with favor Tracy's theory that it is a manifestation of sympatheticotonia.

The position of the syndrome of adrenal insufficiency must therefore be reconsidered.

If the adrenals are completely extirpated in an animal, death results after a short period. The symptoms observed agree fairly closely with those noted in the human subject, in whom complete destruction of the glands has actually occurred. If, however, a small portion of the glands be retained in the experimental animal, no ill effects whatever seem to result. The conception of *mild* suprarenal insufficiency thus receives little support from the physiological side. The human post-mortem evidence is likewise too meager to place this condition on a firm pathological basis. Diagnosis of these cases has been based on the insecure foundation of tests like the white line or the response to medication with suprarenal products. It is suggestive that equally effective cures are claimed for adrenin alone as for extracts of the whole gland. It must be remembered, too, that the symptoms of adrenal insufficiency would be those arising from a disturbance of *all* the functions of the glands; in most of the clinical records, however, there is an attempt to correlate the symptoms with the supposed functions of the medulla only.

It would appear from the foregoing that it is premature to attempt to recognize clinically a condition of mild suprarenal insufficiency until our knowledge of the part played by the adrenals in the normal body economy is considerably extended.

In summarizing his article, Wright says he has studied the white line of Sergent and the literature of the subject.

It is shown by an investigation of 100 healthy individuals that the white line is a phenomenon occurring in a large proportion of normal subjects and is without pathological significance.

A number of analogous physiological responses are described.

The white line is not related to adrenal insufficiency nor to abnormally low systolic or diastolic pressure.

The white line is produced by local emptying of the capillaries due to the active contraction of some elements in their walls, and is quite independent of the condition of the arterioles.

Bubonic Plague.

SIMPSON, in a letter to the editor of the *British Medical Journal* of July 29, 1922, refers to a memorandum on bubonic plague treated with neosalvarsan in that *Journal* for July 22 by Mansoor, in which he says that "prophylactic treatment by vaccines confers immunity for a very limited period, and even then the results are not very encouraging. Some years ago, in a small village in the Punjab, inhabitants were inoculated with vaccine, but unfortunately more than three-fourths died."

Simpson says a statement of this kind is apt to do a great deal of harm, because any one reading it who has not had experience with the great value of Haffkine's prophylactic in outbreaks of plague would likely conclude that the inoculations are not only useless but also dangerous. Mansoor does not mention that the Mul Kowal tragedy happened twenty years ago, and was due not to the prophylactic prepared in the laboratory, but to an accident that occurred to the contents of one of the bottles just before use, by which one bottle out of a brew of five became contaminated with earth and the tetanus bacillus. The circumstances attending this accident were that the assistant, when removing the cork of one of the bottles, let the forceps he was using for that purpose fall to the ground, and instead of immediately sterilizing by heat, as should have been done in the flame of the lamp before further use, he simply dipped the forceps for a moment in a solution of carbolic acid, and then proceeded to withdraw the cork, contaminating the contents of the bottle with the drippings from the soiled forceps.

As regards the period of immunity conferred by inoculation with Haffkine's plague prophylactic, it is longer than that conferred by either typhoid or cholera inoculations, while the results, instead of being, as Mansoor asserts, "not very encouraging," are on the contrary very good and of much service, the average reduction amounting to three times fewer attacks among the inoculated, and should the inoculated take plague the chances of death are

reduced at least twice. Accordingly, the chances of escape from death are six to one in favor of the inoculated, and in many cases they have been more than ten to one in favor of the inoculated.

For populations exposed to infection of bubonic plague and living under crowded and insanitary conditions Simpson's experience is that inoculation with Haffkine's prophylactic is one of the quickest and most powerful weapons we at present possess in preventing the spread of an outbreak of plague, and that it is quite harmless provided proper precautions are taken in its application.

The Treatment of Tuberculous Cervical Adenitis.

In the *Journal of the American Medical Association* of July 29, 1922, MILLER states that when a case reporting to him is studied thoroughly, and when a diagnosis of tuberculous adenitis is made, he proceeds as follows:

1. Hygiene and mode of living are investigated, and corrected as indicated.
2. The tonsils and adenoids are removed, unless contraindicated.
3. Acute abscesses are drained.
4. Discrete cold abscesses without acute superimposed infection are opened through a small incision, and drained for a few days with a small rubber tube.
5. Patients with chronic discharging sinuses are treated with tuberculin plus the mercury vapor quartz lamp.
6. Discrete localized glands are at the outset either removed or treated with tuberculin.
7. Extensive disseminated glands, and those showing deep involvement, are treated with tuberculin. If this fails he then tries Roentgen rays, and lastly operation.

There is no certain therapeutic agent, no absolute specific, and no set rule for treating tuberculous cervical adenitis. To lay down a definite scheme and treat every case thereby is, in his opinion, not productive of the best results. Each patient must be carefully studied and considered as an individual, and then, by the judicious application of his five chief methods—hygiene, light, radiation, surgery, and tuberculin, either singly or in combination (for each has its place)—we approach, as nearly as possible in this stubborn and difficult condition, our therapeutic goal.

Sleeplessness in Infants.

SUNDELL, in *The Practitioner* for July, 1922, states that it is well to bear in mind that the cause for a baby's wakefulness is most often a simple one, and simple causes should be sought for first. Attention to the temperature of the cot and of the room, screening of lights and avoidance of clatter or loud conversation, are so obvious as to require nothing more than mention. Most common of all are the discomforts of the gastrointestinal system — flatulence, colic, hunger, and, what is so apt to be overlooked, thirst; many a child cries in the night for fluid, and is given instead the makings of a lump of casein-curd. It is always worth while to give a wakeful child a drink of water; it is seldom refused, and often satisfies.

There is a certain practice deeply rooted in the minds of all women as an unfailing cure for a baby's sleeplessness, namely, rocking. Rocking is unnecessary, but the baby first likes it, then he expects it, and very soon he begins to demand it and will not go to sleep without it. When this stage has been reached the misguided mother finds that she has forged fetters for herself which are extremely hard to break. While gentle rocking of an infant is only indirectly harmful, the same cannot be said of the vigorous tossing up and down to which some unhappy babies have to submit; as a method of producing wind such treatment is ideal. The doctor who derides rocking of prams and babies has to meet strenuous opposition from parents and nurses, but if he carries his point the day soon comes when they will turn in their sleep and call him blessed.

Some nurses unworthy of the name have a habit of insuring freedom from disturb-

ance of their own rest by giving young infants sugar-balls (*i. e.*, muslin bags containing sugar) to suck; it is well to be alive to this, but detection may easily be delayed till the absence of the nurse removes this solace from the infant, and otherwise inexplicable restlessness commences.

Two other causes of wakefulness must be borne in mind—irregular habits, and excitement while awake. The temptation to postpone the time for a baby's sleep, so that he may be admired by some relative or friend who is late in arriving, or so that his nurse may finish some work on which she may be engaged, must be strongly resisted. A sleepy child who is kept awake exhausts his nervous energy very quickly in peevish restlessness, and when preparations are at last made for his sleep he may be too weary to settle down. Physiological proof of this indisposition for slumber is to be found in the increased reflex irritability of a sleepy child, an irritability which is soon soothed into sluggishness should sleep be not too long delayed, but which persists and increases if the balm of sleep is withheld.

Regularity of habits is one of the sheet-anchors by which the barque of an infant's health is secured. The reëstablishment of a regular routine, after even a short break, frequently calls for patient perseverance on the part of the nurse, but though the child may protest vigorously for several nights, absolute firmness seldom fails to produce the desired result. Excitement during waking hours is a common cause of restlessness at night. A baby should be regarded much more as a vegetable than as an intelligent human being; intelligence develops quickly and spontaneously, and attempts to force its display by the antics of onlookers are harmful.

The cases of sleeplessness which will not yield to simple treatment on the lines indicated are few, but when wakefulness has been allowed to become a habit treatment by drugs may be necessary. Drugs should only be resorted to when all other means have been tried and have failed. Administration of a hypnotic to an infant must be strictly reserved for the really exceptional cases, and should be regarded as a last resource. Our aim should be merely to reëstablish the normal habit of sleep in the child. This aim is best attained by employing drugs in a descending scale of dosage. A really adequate dose should be given the first evening, so that the child is certainly sent to sleep; the rest thus obtained will make him more ready for sleep the next night, and half the initial dose should then be given. On the third evening a quarter-dose should suffice, and on the fourth evening no drug at all should be necessary. For a four-months infant, 4 grains of ammonium bromide with 12 minims of syrup of chloral would be a suitable dose; for a child of six months, 3 minims more of chloral might be added with advantage. Synthetic sedatives are unsuitable for young infants, and opium with all its derivatives is dangerous; the only possible justification for its use is the intense pain of an acute affection such as otitis media, and in such a case it can only be regarded as a temporary measure of relief and secondary in importance to direct treatment of the cause of the pain. Success in the treatment of sleeplessness in infants is a good standard by which to estimate the patience and skill of the practitioner.

The Therapeutics of Emetine.

CHOPRA and GHOSH, in the *Indian Medical Gazette* for July, 1922, state that the most important point to be appreciated is that emetine is a very powerful drug having a toxic and cumulative action. Its value has been fully established in amebiasis, and for this reason cases should first be carefully diagnosed before being treated with emetine. The dosage and length of administration demand most careful consideration. The physician should be on the watch for toxic effects, and the patient kept in bed, carefully dieted, and the pulse-rate recorded daily. The drug must be stopped on the appearance of any toxic symptoms. Special care should be taken that convalescents who have undergone a course of emetine

are allowed up gradually, and if there be any increase in the pulse-rate, made to go back to bed. As regards the dosage and length of treatment, one grain subcutaneously every day for twelve days will cure most cases, though some give half a grain daily by the mouth as well, in the form of keratin- or salol-coated pills, making a total of 18 grains. If emetine by the mouth cannot be tolerated the course of injections may be increased up to a maximum of 15 grains. Larger doses than this in a single course are not advised, and if amebic cysts are found afterwards, the course should be repeated, but if possible not within a month.

Emetine-bismuth-iodide is given in three-grain doses for twelve successive days, but some patients cannot tolerate these large doses, while in others the feeling of depression is just the same as with emetine. The dose may be reduced in such cases. Diarrhea often occurs during the course of bismuth-emetine-iodide, but is usually a favorable sign.

Alkalies in Acidosis.

CLARKE and DOW, in the *Archives of Pediatrics* for July, 1922, state that it would seem from their work in administering soda bicarbonate by mouth that absorption is very slow, probably too delayed to do much good in acute acidosis cases.

Ringer's solution when administered by the intraperitoneal route has no appreciable effect in increasing the carbon dioxide combining power of the blood.

A 4-per-cent solution of soda bicarbonate given by the peritoneal route is almost negligible in its effect, in so far as increasing the carbon dioxide combining power of the blood is concerned.

Their observations would lead them to believe that larger doses than a 4-per-cent solution of soda bicarbonate administered intraperitoneally have a very distinct influence in increasing the blood alkalinity, but there at once comes the danger of an alkalosis.

Solutions of soda bicarbonate given by rectum are absorbed, but probably more slowly than by mouth.

The Van Slyke apparatus is practical and will no doubt prove to be of assistance both in diagnosis and differential diagnosis.

In common with other observers, they are led to believe that the alkalies when given in the usual way have very little if any curative effect in acidosis.

Vomiting in New-born and Young Infants.

LAPAGE, in *The Practitioner* for July, 1922, states that if the vomiting is metabolic in nature, a period of starvation, the length of which depends upon the severity of the symptoms, must be adopted, and in the meantime the dietetic error eliminated. If there is overfeeding with breast-milk, the mother's diet must be revised, and, if necessary, the breast-pump used to diminish the amount taken by the infant. Some breast-milks are of bad balance; for instance, a thin, watery milk often contains too much protein and too little fat; in such cases, the addition of fat in the form of milk to the mother or mixed feeding may be of great value.

For protein vomiting sodium citrate (gr. ij to the ounce of milk) is a useful remedy, though it causes constipation. Heat diminishes the size of the curds and increases their digestibility. This is why dried and cooked milks are so often more digestible than fresh milk. Peptonizing or the use of predigested foods may help. Finally, resort may have to be made to whey and meat-juice, or whey and albumen-water, with albulactin, which forms quite a useful protein addition for curd-vomiting babies. Sometimes a sweetened, condensed milk is useful before coming down to whey. Whey mixtures are hardly sufficient to nourish a baby for long, and after four days, or at the most a week, it is better to find some more sustaining food.

For fat-vomiting, which is common, milk and water mixtures without any added cream can be used. One of the most useful

mixtures for out-patient babies is a milk and water mixture, sterilized for thirty minutes and sweetened, with no cream, but with extra fat in the form of emulsion of cod-liver oil, half a teaspoonful three times a day to infants from six months to one year. Many babies who vomit on a full fat mixture will take this well, because not only is the protein rendered more digestible by cooking, but also the fat of cows' milk, which is the real difficulty, is reduced in amount and replaced by the more digestible cod-liver oil emulsion. In the same way, when the full-cream dried milks cause vomiting, the half-cream dried milks may succeed. When ordering two or three days' starvation to restore tolerance, water can be used at first. Many cases of vomiting are accentuated by giving babies milk, when they are really thirsty and in need of water. The average mother greets with much surprise the advice to give the baby water. After the day, or two days, on water, vegetable broths are useful, as recommended by French pediatrists. They supply salts and vitamins. The main object is to maintain the strength until a condition of hunger is established. The overfed, toxic, and pale baby with low tolerance is a much worse subject than the clear-eyed, pink baby whose alimentary canal is crying for food. Vomiting will not be present for long in the latter, unless there is some mechanical cause. Discipline and good nursing count for much, especially in temperamentally excitable babies. Even young babies may form a habit of vomiting, and it is easy to call to mind cases in which firmer handling by a good nurse has made a great difference.

Drugs are dealt with briefly because it is important to treat vomiting by methods other than the use of medicines. Some of the cases have acidity, and will be much benefited by a little sodium bicarbonate in each feed. These include the babies who often have acid and sour sickness. Sometimes, since this is due to excess of fat and possibly pyloric delay, it is good to give a food weak in fat, at the same time as giving the sodium bicarbonate; tincture belladonna, one minim or half a minim, before a feed may be useful. Gray powder is very useful as a cholagogue and as stimulating metabolism in chronic cases. If there is much distention in relation to the vomiting, nothing is better for one thorough clearing of the bowel than castor oil; and if there is much intestinal infection, as in the case of pyelitis, a course of calomel, say gr. 1/6 two or three times a day, over a period of two or three days, is valuable.

In spasm, brandy is useful as a sedative to allay it, and in weakly babies is an aid to digestive processes. The use of bismuth and other sedatives must be carried out judiciously and whenever necessary, but it is important to note that they should not be used indiscriminately and without at the same time remedying faults which are causing the trouble.

Lavage is of great use in vomiting, and is very easy to perform. It is the simplest matter to pass a rubber catheter, attached to a tube and funnel, into the child's stomach, provided its arms are shut away in a towel. Many infants seem to enjoy the process, and if the catheter is smeared with a little lubricant, the baby swallows the end of it and the tube is gently pushed down into the stomach without any anxiety or difficulty. When it reaches the stomach a little of the gastric contents usually appears at the glass window and shows that the tube is in position. It is then easy to wash out the stomach with a weak sodium bicarbonate solution, taking care not to raise the funnel too high. Occasionally mucus blocks the tube, but this can be remedied.

Another condition for which lavage is very useful is for the acute irritability of the stomach in the early stages of infective diarrhea. Sometimes those very acute infective diarrhea patients, who are vomiting everything and are having very frequent stools, can be made comfortable by washing out the stomach and the bowel, and then giving the starvation diet. Without lavage they may have persistent vomiting.

Lavage must, therefore, always be remembered as being one of the best therapeutic measures for soothing an intractable stomach.

With regard to the operation usually done for pyloric stenosis, Lapage believes that babies stand the rapid Rammstedt operation very well, and the after-results are very good.

Strychnine Excretion.

In the *Journal of Pharmacology and Experimental Therapeutics* for July, 1922, WEISS and HATCHER state that strychnine sulphate was administered orally and intramuscularly in single doses of 4 mgm. and in repeated oral doses; the urine was collected in periods of six hours, twelve hours, and twenty-four hours, and the amounts of strychnine present were estimated by means of frog tests.

The kidneys excrete amounts equal to 20 per cent of that administered at one time, and a much lower percentage of larger doses taken by the mouth over periods of twelve and twenty-eight hours, respectively.

The percentage of the strychnine excreted by the kidneys is a measure of the eliminative efficiency of the liver, rather than that of the kidney itself, for the kidney excretes only that which the liver fails to excrete.

Diuresis hastens the elimination of strychnine by the kidneys, but it does not necessarily increase the total amount eliminated in the urine after a single dose injected intramuscularly, and it may, in fact, be attended with the renal elimination of a smaller total than would occur in a similar experiment without diuresis.

The liver appears to be the principal protective organ with reference to acute poisoning by strychnine, the kidney being concerned mainly with the elimination of traces of the poison which reënter the circulation after having been fixed temporarily in those tissues which are incapable of destroying the poison.

Constipation in Young Children.

In *The Practitioner* for July, 1922, PRITCHARD states that constipation in children is generally due to defective training in earlier infancy and to the abuse of drugs. It sometimes occurs as the result of a previous attack of enteritis, colitis, or dysentery. Violent purges, soap-and-water enemata, and glycerin suppositories have subversive results, while contraventions of the canons of physiological feeding in order to snatch an immediate cure are just as fatal. The commonest dietetic resource in the treatment of constipation in children is to keep on increasing the total intake of fat by means of butter, cream, bacon-fat, or cod-liver oil until improvement results. The wise man will not rely on this method of cure. For the benefit of those who may not know the approximate amount of fat required in the twenty-four hours by children of different ages, he appends a table of quantities to show the average physiological requirements of fat for different ages. These quantities should not be exceeded.

Average Fat-requirement of Children at Different Ages in the 24 Hours.

First month.....	0.7 oz.	Second year.....	1.5 oz.
Third month.....	0.8 oz.	Fifth year.....	1.6 oz.
Sixth month.....	1.1 oz.	Tenth year.....	1.7 oz.
Ninth month.....	1.3 oz.	Twelfth year.....	1.8 oz.
First year	1.4 oz.		

There is a popular belief that porridge is a cure for constipation; if it does cure the condition, its virtue as a therapeutic agent is of the same character as that of figs, raspberries, currants, etc., which give relief by irritating the mucous membrane of the bowel in a manner that not only produces an immediate effect, but also not infrequently leads to chronic diarrhea, or to colitis. As far as dietetic treatment can be depended on to correct the condition, reliance must chiefly be imposed on observance, and not on the breach, of the cardinal rules of physiological feeding, which have reference to quantity, balance, inclusion of all accessory factors and qualities of digestibility, but in addition care must also be taken to supply a considerable quantity of the food in the form of vegetables and fruit, since their cellulose framework, which is quite indigestible and indestructible, fills

up space in the bowel and imparts the required stimulus to the neuromuscular elements so necessary for adequate peristalsis.

Cellulose of this kind is practically the only safe food residue which can be depended on to form the basis of a natural stool; all other forms of residue are liable to irritate or undergo toxic decomposition. Fruits such as bananas, which contain a large proportion of cellulose fibers, are often interdicted for children because threadlike residues of cellulose (often mistaken for threadworms) are found in the stools of those who have eaten them. This is a pity, for bananas have great merits both as a food and as regulators of bowels.

Physical exercises, designed to bring the abdominal muscles into play, are most useful ancillary expedients, and these exercises can be combined with massage and manual manipulation of the colon.

Acid Milk in Infant Feeding.

SHAW and WILLIAMS, in the *Archives of Pediatrics* for August, 1922, state that most of the advocates of the acid foods, buttermilk, acid milk and albumin milk, limit its use to gastrointestinal disorders, and after improvement or in the course of one or two months to switch over to modifications of fresh milk. Bradley of St. Louis in 1912 was one of the first to recommend acid milk as a steady routine diet for both healthy and sick infants in institutions. In 1910 they adopted the de Mattos method of preparing artificial buttermilk in which whole milk is soured by the addition of a lactic-acid culture, and after coagulation adding sugar and flour and boiling for three minutes.

The institution in which they carried out their tests has a daily population of from 20 to 30 bottle babies, and the result is so satisfactory that this method of feeding is continued. It is safe to say that over 3000 babies have been raised on this food with more or less success. Other methods have been tried during this period, but the Sisters have always requested a return to the sour-milk mixtures as the babies gained faster, looked healthier, and were happier. Made in large quantities it is very easy and simple to prepare and has several advantages for use in infants' institutions.

The results in private practice have not been so successful or satisfactory, and for some unexplained reason its use did not meet with the same success in another infant institution in the same city. At this latter institution the malt-soup mixtures were prepared one day about seven years ago with acid milk instead of the customary sweet milk, and the mistake was not discovered until after all of the babies had taken one bottle. It was taken as eagerly as the ordinary feedings, so it was decided to try the experiment of using the acid milk in a series of babies and compare the result with babies fed on malt-soup mixtures made in the orthodox manner. A frequent and distressing condition found with the malt-soup babies was the irritated and often excoriated buttocks, a result of frequent loose stools. These stools were acid and often foul and offensive, and malodorously perfumed the wards. The most noticeable effect of the acid-milk malt-soup mixtures was the absence of sore buttocks and stinking stools. After a short trial the use of sweet milk was discontinued and acid milk was used in all the malt-soup mixtures. The acidity of the malt-soup mixtures made with sweet milk averaged 6, which is low on account of the bicarbonate of potash in the malt-soup extract. Made with the acid milk the acidity averaged 48. Shaw and Williams are now using the plain malt extract which does not contain the alkali, with satisfactory results, and these mixtures have an average acidity of 65.

At the request of one of the managers about a year ago five babies were fed on acid-milk mixtures made from spontaneously soured milk. They followed a technique recommended by a trained nurse from Holland, who claimed it was the method in general use in that country. Fresh whole milk is poured into a bowl

covered with cheese-cloth and allowed to sour for two days in a warm room until it thickens like junket. It is then churned in a small glass butter churn for several minutes until it resembles fluid milk. A heaping tablespoonful of sugar and one of flour for each quart are mixed into a paste with a little of the milk, and this is added to the churned milk and then boiled for three to five minutes while stirring. If in the cooking it appears as though separating a little more flour should be added. They found that by adding a little of the soured milk to the fresh milk as a "starter" it would sour sufficiently in twenty-four hours. This can be fed without dilution to very small infants, although it is best to add from one-half to one ounce of water in each feeding for the first few days.

The results have been most satisfactory, and up to the time of report 46 babies have received this food besides 14 in private practice. Most of the babies made very rapid gains in weight, often more than a pound the first week, and while some have occasional attacks of vomiting and colic, yet the babies appear so well and gain in weight so steadily that the food has not been changed. In five out of eight cases of general and facial eczema there was a marked improvement in the first week. No signs of rickets have appeared as yet in any of these acid-milk babies. Nearly all of the colored babies who remain in the hospital for a long period show marked signs of rickets, but the one colored baby who has been fed on this mixture for five months appears normal in every way.

Control of Lice on Body.

The *United States Naval Medical Bulletin* for August, 1922, in reply to a query on this topic gives the following good methods for their destruction:

Crab Louse.—(1) Kerosene emulsion soap. The soap is made by boiling 1 part of soap chips in 4 parts of water and then adding 2 parts of kerosene oil, or 4 parts of gasoline. This jellies when cold, and 1 part of this soap jelly is added to 4 parts of warm water, making a good liquid soap at very small cost.

This is followed by vermin jelly:

(2) Texas fuel oil, sp. grav. 0.86 b. p., 250 to 350° C., 50 parts;
Crude vaselin, 20 parts;
Soft soap, 30 parts.

The cutting or shaving of pubic or axillary hairs is to be avoided because of the discomfort caused. Powders such as N. C. I., etc., should not be used in the pubic regions.

Head Louse.—Wash head with equal parts of kerosene and vinegar or 25-per-cent acetic acid for one-half hour, keeping the head covered with a towel. The vinegar separates the eggs from the hairs, while the kerosene kills them. Use a fine-toothed comb to remove the eggs and lice. Wash the head with warm water and soap containing kerosene (Nuttall).

Body Louse.—(1) Bathe, using liquid kerosene soap emulsion; (2) disinfect clothing, possessions, etc. In absence of facilities for the above—insecticidal powder (Moore):

Creosote, 1 cc;
Sulphur, ½ gr.;
Talc, 20 grs.

Tonsillectomy in Children with Endocarditis and Frequent Tonsillar Infections.

KAIDEN, in the *New York Medical Journal and Medical Record* of August 2, 1922, states that the following points seem to him of importance as evidence of localization of primary focal infection in the tonsils:

A history of repeated sore throats. Such history can usually be obtained. By sore throat he does not necessarily mean frank follicular tonsillitis. Experience has shown that a patient may suffer from frequent follicular tonsillitis and show no systemic disorders or sequelæ beyond the febrile disturbance at the time of the attack. On the other hand, a patient may never have had any attack of follicular tonsillitis, he may even never complain of a sore throat, yet his tonsils may be the site of a focal infection through which organisms and toxic

material may gradually or suddenly be absorbed or thrown into the circulation, thus causing the various rheumatic manifestations already referred to.

Such difference in action between acute follicular tonsillitis and a chronically inflamed tonsil may perhaps be best compared to other organs where evident inflammation produces spectacular local symptoms, while the slow insidious inflammation of the same organs may be later responsible for far-reaching serious systemic disorders. Alveolar inflammation, for example, causes no more than a local abscess, while an apical tooth abscess, although minute, difficult of recognition, and diagnosable by the aid of the *x*-ray alone, may be the cause of so-called chronic rheumatism. Similarly acute appendicitis may cause violent acute illness calling for immediate and radical intervention, while chronic appendicitis may produce chronic dyspepsias lasting for years. Indeed, is it not possible that many etiologically puzzling systemic diseases, such as myocarditis, arteriosclerosis, chronic nephritis, and diabetes have their origin in some insidious chronic infection in the body not recognizable by our present crude methods of diagnosis, but which we hope later to be able to recognize and treat medically or surgically before systemic effects become manifest? As far as the tonsils are concerned, fortunately, they can be easily seen and examined, and if we can establish the relationship between diseased tonsils and rheumatic manifestations, it should call for early removal of the tonsils, even before rheumatic symptoms set in. This applies particularly when the onset of cardiac disease is feared.

When the tonsils are diseased, the anterior pillars present a characteristic red, "corned beef" appearance. This is in marked contrast to the remainder of the mucous membrane of the oropharynx. The characteristic color may be confined to a narrow strip of the free border of the pillar, or in some neglected cases the entire pharynx may present this appearance. A pillar of this color always denotes a chronically diseased tonsil. This coloration of the anterior pillar is especially noticeable in the chronically diseased tonsils of adults.

Simultaneous pressure on the anterior pillar and on the tonsil with two tongue depressors, one held in each hand, causes exudation of a cheesy whitish material.

Most cases of chronically inflamed tonsils, particularly in children, show enlarged tonsillar lymph nodes at the angle of the jaw. During an acute exacerbation these nodes may also become tender.

The Quinidine Treatment of Auricular Fibrillation.

HAMBURGER and PRIEST, in the *Journal of the American Medical Association* of July 15, 1922, in their conclusions state:

1. Quinidine sulphate has been administered by them to eighteen patients suffering with auricular fibrillation. In eleven (61 per cent) a normal cardiac mechanism was established, which in five (27 per cent) has persisted three months or more. One patient has maintained a sinus rhythm uninterruptedly for eleven months.

2. Cases of acute fibrillation or recurrent paroxysmal fibrillation are most amenable to quinidine treatment. In these patients the duration and frequency of the paroxysm can be promptly controlled without undue risk.

3. The following is offered tentatively as a means of selecting cases of auricular fibrillation in the order of their decreasing suitability for quinidine treatment: (*a*) patients with acute fibrillation or recurrent paroxysmal fibrillation; (*b*) patients with fibrillation of short duration without history or findings of heart failure or embolism; (*c*) patients with signs and symptoms of early or apparent heart failure, but without evidence of advanced heart failure.

4. In patients with moderately advanced or advanced heart failure, and history or findings of embolism, endocarditis, heart block, angina pectoris, coronary disease, quinine idiosyncrasy, or prolonged chronic fibrillation, quinidine is contraindicated.

5. Equally good results are obtained with small amounts of quinidine (0.2 gm.) given

frequently (every two hours), to be continued in most cases once or twice daily after restoration of sinus rhythm.

6. Quinidine may usually be given at once without preliminary digitalization. If, after restoration of normal rhythm, the ventricular rate remains high, signs of heart failure continue, or frequent relapses to fibrillation occur, digitalis should be subsequently administered.

A Note on Luminal in Epilepsy.

JOHNSON, in the *Lancet* of August 5, 1922, states that some years have elapsed since luminal was first recommended as a drug useful in epilepsy. The object of this note is to draw attention to its value and to recommend its use to a much greater extent than appears to be the case at the present time. His experience with luminal in the treatment of epileptics extends over the last two years. He began using it for those cases—so well known in the out-patient department—in which drugs had been used for several years and the patient had wandered from hospital to hospital without any improvement in the condition being obtained. The result proved so surprising that he commenced prescribing it and noting results in all varieties of "fits." The beneficial effect of the drug has seemed to be extraordinarily wide.

In the first place, in those cases of idiopathic epilepsy which show little or no response to treatment with potassium bromide, together with those cases in which potassium bromide has reduced the fits to a certain level (which then remains stationary), luminal ½ grain added to the bromide mixture has in nearly every case resulted in an immediate lessening in the number as well as in the severity of the attacks. He is not as yet prepared to dogmatize, but it has seemed as if the minor attacks have yielded somewhat more readily than major epilepsy. To give one instance —that of a boy aged ten years, who was having 20 to 30 attacks of petit mal daily, in whom, within one week, the attacks were reduced to three or four a day. These were typical petit mal seizures; one occurred in front of Johnson whilst he was interrogating the mother. The eyelids suddenly began to blink rapidly and the boy to sway on his feet. The eyes were then strongly turned to the left and momentary unconsciousness occurred. In a few seconds the boy recovered, and although slightly dazed was able immediately to answer a question which was put to him. The mother's own expression on the occasion of the second visit was that the improvement was "miraculous." He had previously been treated for years, presumably with bromide. In other cases slower improvement has occurred, and in these it has been his practice to increase the dose by ¼ grain weekly if necessary, up to a maximum dose of 2 grains three times a day. He has never had occasion to give larger doses than this for epilepsy, although, as will be mentioned later, larger doses may be given. In the majority of his cases ¾ grain combined with potassium bromide 10 grains, given three times a day, has proved adequate.

The next cases which were tried belonged to the large group of fits associated with organic cerebral lesions. Four cases of cerebral diplegia in children—where the fits were not controlled by bromide—all showed immediate improvement. The attacks have not entirely ceased, but as they are becoming progressively less, one hopes in time that they will be completely controlled. In this connection he states that the drug has not produced any untoward effect on the patient's mental state. The mothers, in fact, state that the children are brighter —a condition to be expected, however, merely from the lessening of the fits. In children of two years the initial dose has been ⅛ grain t. d. s. In one case of congenital syphilis—a girl of eleven years—with severe scarring round the mouth definite improvement in the fits and mental condition has also occurred. Obstinate fits associated with infantile hemiplegia have also responded satisfactorily.

In Johnson's series of cases, which number about 25, he has definite absence of improvement in two cases only—both, he

thinks, cases of idiopathic epilepsy—one a child of three years and the other a man of twenty-eight. The former, however, is said to have sustained a severe fall on the back of the occiput prior to his attacks, and it is possible there may be some local cortical trauma. Whether traumatic epilepsy will prove to be rather less amenable to the drug than the idiopathic form must be left for future observation. With doses above 2 grains three times a day untoward effects have occasionally occurred. The patient has become "peculiar," and a form of mental excitement going on to mania may result unless the drug is withdrawn.

Finally, larger doses of the drug may be used in the attempt to influence certain forms of mid-brain tremor. He has used it in cases of paralysis agitans and in the rhythmical tremor following lethargic encephalitis—but as yet with no very pronounced benefit. He recalls a case shown recently by Feiling, in which 6 grains were being given three times a day with good effect, but he has not as yet given anything approaching this dose. An investigation of the value of luminal in the treatment of the severer forms of chorea is at present being undertaken.

In conclusion, it would appear that in this drug we have a valuable therapeutic agent worthy of a place amongst the dozen or so drugs which form the standby of the physician.

Phenol and Cresol Poisoning.

ISAACS, in the *Ohio State Medical Journal* for August, 1922, states that the treatment in lysol poisoning has been as varied as in the case of phenol. Lard, milk, butter, whisky, olive oil, mustard, magnesium sulphate, sodium bicarbonate have been used to neutralize, absorb, and wash out the poison.

Repeated investigation in many cases shows that most of these antidotes can be dispensed with; a simple lavage, either with the stomach tube or induced vomiting, using 5-per-cent solution of sodium bicarbonate, is quite effective. In cases so treated, especially if followed up with enough bicarbonate to quickly make the urine alkaline to methyl red, no signs of renal complications were encountered, as noted before. Magnesium sulphate may be used following the gastric lavage, to induce catharsis. In cases of severe collapse, caffeine - sodium - benzoate hypodermically may be used, but the quickest and safest method is to give a saline solution intravenously, as in the case of phenol poisoning, 500 to 1000 cc, repeating in twelve hours, if necessary. The skin and mucous membrane burns may be washed with sodium bicarbonate solution (2 to 5 per cent), and, if very edematous, magnesium sulphate (50-per-cent solution) may be used on the mucous membranes. Orthoform as a spray or one gramme internally may be used to relieve pain. For burns in the eyes, olive-oil irrigations have been used. Petrolatum may be applied to the skin or lips. A liquid or soft diet may be given until the danger of hemorrhages is past. The average duration of hospital observation was 4.3 days.

So far no strictures or symptoms of scar formation in the gastrointestinal tract have developed in his series, after the lapse of one to five years.

Intravenous Therapy in General Practice.

FRICK, in the *Medical Review of Reviews* for July, 1922, states that as the result of ten years' use of the intravenous method of administering drugs he finds the following:

1. Sodium salicylate, 1 to 2 grammes dissolved in 20 cc of sterile water given every eight to twelve hours, is very effective in (*a*) a streptococcic infection; (*b*) all types of penumonia; (*c*) pleurisy with or without effusion; (*d*) generalized infections—so-called rheumatism, either muscular or articular.

2. Urotropin in doses of one-half to one gramme dissolved in 10 cc of sterile water, either given by itself or combined with one gramme of sodium salicylate, in which case

20-cc volume is necessary, is effective in (*a*) pyelitis; (*b*) otitis media; (*c*) mastoid involvement; (*d*) pneumonia and pleurisy with effusion.

3. Sodium iodide in doses of from one to two grammes dissolved in 20 cc of sterile water, given every eight to twelve hours in acute cases, or in chronic cases every third day or until signs of iodism appear, is especially effective in (*a*) chronic arthritis; (*b*) Berger's disease; (*c*) indolent ulcers; (*d*) asthma; (*e*) chronic headache; and in diseased cond tions in which there is likely to be as the basis of the trouble an increase of connective tissue in the blood-vessels or the vital organs of the body or in or about the joints.

4. Two-per-cent sodium citrate solution in 8-ounce volume given intravenously every third or fourth day is practically a specific for endarteritis obliterans when not too far advanced.

5. Sodium cacodylate in from one-half- to one-gramme dosage dissolved in 10 cc of sterile water, given intravenously every third or fourth day, is an excellent remedy in most forms of anemia, and when so employed in every instance increases the hemoglobin as well as the red cell count.

Bees' Honey in Substitute Infant Feeding.

In the *New York Medical Journal and Medical Record* of August 2, 1922, LUTTINGER states that he has no occasion to observe the many vaunted curative powers of honey. The 419 cases in which he has used honey were mostly feeding cases; but he did observe that fresh honey, especially virgin honey directly obtained from the honeycomb, has a decided laxative action which it loses upon boiling. Secondly, fresh honey seemed to have a pronounced soothing effect upon infants. Honeys with strong aromas exhibited this action to a greater extent than those which were comparatively odorless. Those who were fretful before exhibited a remarkable change of temper after being put on honey. The tendency to fall asleep after feeding was greatly increased. Whether this is due to general improvement, to lessened gas formation, or to some hypnotic action, he cannot tell. He has also noticed an increase in the urinary secretion, or, at least, an increased urinary output. Finally he has successfully substituted honey for orange juice and for cod-liver oil.

Notwithstanding the negative reports of some investigators, he found that fresh honey is abundantly provided with all three accessory food factors which have such a preponderant influence upon animal metabolism.

Hawk and his collaborators, experimenting with albino rats, found only minimal amounts of fat-soluble vitamin A and water-soluble vitamin B in strained honey. In comb honey, the fat-soluble accessory factor was found in moderate amounts. These results show the importance of the proper kind of honey for experimental as well as for nutritive purposes. Neither Hawk nor Faber found any antiscorbutic water-soluble vitamin C. Faber, however, experimented with only ten guinea-pigs, insufficiently controlled. Dutcher found small amounts of the antineuritic vitamin in honey.

In his own experiments he found all three vitamins in eighty-two per cent of the honeys examined. This, coupled with the other advantages of honey, induced him to discard all other sugars in the substitute feeding of infants. He takes this opportunity to plead for the use of the term substitute feeding instead of artificial feeding, now in vogue. The latter term should be reserved for feeding not administered by mouth.

The gross adulterations of honey, so prevalent before the Federal pure food law went into effect, when it was possible to palm off, as honey, a decoction of commercial glucose with a dead bee in it, are rarely met now; but there are still a number of honeys on the market mixed with starch, glucose, gelatin, mucilage, chalk, water, and other substances. It is, therefore, of the utmost importance that the mother or nurse be instructed to obtain a

pure product, and, in case of doubt, to use comb honey, which is easily obtained from the comb by cutting off the top and allowing the liquid to run out by gravity. Again and again he has had to discontinue the use of honey because it was found to lack the essential elements of its normal composition. He does not refer, of course, to the artificial honeys so much in use in Central Europe. Those are no more honey than chicory is coffee. Some of them are such clever imitations that it is almost impossible to distinguish them from the genuine article.

The general practitioner ought to familiarize himself with a few simple tests in order to detect the grosser adulterations. Thus the specific gravity is a good indication of the amount of water. Genuine honey has a tendency to crystallize or sugar—*i. e.*, to form into a soft granular mass. When dissolved with twice its weight of water it should form a clear solution and not a stringy one with a specific gravity of not less than 1.099, which is equal to 1.370 of the original honey. It should react acid to litmus paper and turn the polarized rays of light to the left. Five grammes of honey dissolved in twenty grammes of water (distilled) should become only faintly opalescent upon the addition of a few drops of silver nitrate or of barium chloride, indicating no excess of chlorides or sulphates, respectively. When one cc of absolute alcohol is allowed to flow down the walls of a test tube, one centimeter in diameter, containing two cc of a filtered one-to-four honey solution, the line of contact would show a barely noticeable opalescence, which soon disappears; a permanently milky zone indicating the presence of starch sugar. If half a cc of this honey solution is allowed to flow upon two cc of pure sulphuric acid, the colored line of contact should not appear at once; at the end of one hour it turns yellowish to clear brown. When a brown line appears which turns black within thirty minutes, it shows cane sugar.

When one part of honey and five parts of water are boiled, allowed to cool, and then a little iodine added, the solution should turn neither blue nor green; otherwise the honey contains starch.

It is unfortunate that the average pharmacist does not carry a brand of pure honey. Although *mel* and *mel depuratum* are official United States Pharmacopœia preparations, there is no standard, and in fact there can be no adequate standard, for such substances as honey. Furthermore, *mel depuratum* or clarified honey is actually robbed of its aroma, taste and vitamins by the pernicious method prescribed for its preparation by boiling. The United States Pharmacopœia should either prescribe the classification of honey by the calcium carbonate and animal charcoal method or drop honey altogether from its list of official remedies. He takes this opportunity to suggest that if honey is retained in the next edition of the Pharmacopœia its vitamin content, as well as that of many so-called complete foods, be stated on the label.

Paradoxically enough, it sometimes happens that honey obtained from the comb is lacking in either the vitamins, organic acids, levulose, or all three of these constituents. This fact, which puzzled him for a long time, he finally traced to the habit of some farmers to feed their bees with molasses, especially when there was a scarcity of flowers or when the season had been an unusually rainy one. The bees gorge themselves with the sugar in the vats in front of the beehive, which they immediately deposit in the combs without giving it a chance to undergo inversion. Under this system the producer can swear that his product is pure bees' honey; but it is, nevertheless, an adulterated article unworthy of its name and lacking all the properties of real honey.

Finally, a word as to the storage of honey. The statement is often found that honey should be stored in the ice-box. In his experience this should be the last place for the storage of honey, which owing to its hygroscopic property absorbs moisture and is likely to spoil. A dry place is the first choice, and if it can also be cool so much the better; but it must be dry before anything else. During the war the price of honey was very high; but now it can be

bought at prices which compare favorably with that of sugar, especially when bought in wholesale quantities.

Luttinger now uses honey as a routine component of all his formulæ for substitute infant feeding. Wherever there is an indication for sugar, lactose, or maltose, he invariably substitutes honey, and the results obtained in 419 cases studied so far encourage him to plead for a more general use of honey by the profession. The proportion is one teaspoonful of honey to an eight-ounce bottle of the feeding mixture.

He is also using honey more and more extensively in marasmus, rickets, scurvy, malnutrition, and other conditions, in which he formerly prescribed the various sugars, cod-liver oil, or patent foods.

Exophthalmic Goitre.

In the Proceedings of the British Medical Association, the Section on Medicine, published in the *British Medical Journal* of August 12, 1922, reference is made to a paper on this subject by Murray in which, dealing briefly with the general pathology of the condition, he discusses the possible cause of exophthalmos. The three main views as to its causation which had been put forward were those of (1) vascular engorgement, which, in his opinion, had little to support it; (2) increase of orbital fat; (3) overaction on the part of Müller's muscle. This last view was not, in Professor Murray's opinion, a probable one, since the fibers of this muscle were very feeble, the muscle too far from the globe to produce proptosis, and, furthermore, if it did, it should, from its anatomical position, do so in an upward and forward direction. He inclined to the second view, namely, that an increase of orbital fat was the most likely cause of the proptosis.

Murray next dealt with some of the etiological factors. In a series of 300 cases he had found that the disease occurred more frequently in women—to the extent of three to one, but it was interesting to note, he said, that former statistics had shown a proportion of eleven to one, indicating, therefore, that sex was not as important a factor as was hitherto thought. He pointed out that a family history was sometimes obtained, and instanced a number of cases to support this. Nervous strain and shock were certainly factors, but the condition seldom resulted from physical injuries.

Murray then went on to discuss the relationship of simple goitre to exophthalmic goitre, and urged the importance of treating many of the simple cases along the same lines as would be adopted in Graves's disease. He emphasized the importance of recognizing the symptoms of exophthalmic goitre in its early stages, as treatment, if adopted then, was much more likely to be of value than if the case was one of some duration. As regards treatment, Murray said that almost complete rest was essential at the commencement. It was his practice as regards diet to allow no red meat or extracts, but he was in the habit of giving milk and fats in usual amounts. In discussing the value of *x*-rays in the treatment of exophthalmic goitre, Murray emphasized the importance of discontinuing this method of treatment if no improvement had attended it after six months' trial. Radium he had found useful in many cases, but there was danger in acute cases. Surgical treatment was indicated if medical treatment had failed, if the thyroid gland was much enlarged, or if time was an important factor to the patient; but the risk of operation could not be forgotten.

Wilson, in discussing the paper of Murray, asked why it was that more progress was not made in the subject of exophthalmic goitre. He himself thought it was because all discussions centered round late cases, whereas attention should be riveted on the early recognition of the disease. He urged the importance of basic metabolic measurements in the early diagnosis of the condition, and showed several cases on the screen which illustrated the diagnostic value of the basic metabolic rate in relation to exophthalmic goitre.

Mr. James Berry said that coöperation between physician and surgeon was of ex-

treme importance in the successful treatment of Graves's disease. He admitted the danger in operative measures, and emphasized the importance of having the patient under personal observation for at least a few days before the operation was performed. He admitted the undoubted benefit from rest and *x*-rays in many cases, but warned his hearers against carrying on *x*-rays too long. The longer the duration of the disease, the more unlikely was it to be successfully treated at the hands of the surgeon. In acute cases surgery should be avoided during the most acute stage unless there was definite evidence that no myocardial degeneration was present. During remissions of the disease operation gave the best results. Ether in small quantities was, in his opinion, the best anesthetic; local anesthesia was disappointing, and chloroform dangerous.

Riddell of Glasgow said that about 80 per cent of patients suffering from exophthalmic goitre got relief from *x*-ray treatment. In some cases the thyroid gland might not show much decrease in size, but the amelioration of symptoms suggested that the *x*-rays had been of benefit. He was in favor of giving fairly long applications at considerable intervals rather than minute doses frequently. He agreed that no good was got from continuing treatment for more than six months.

Purves of South Africa urged the importance of vaccine treatment in cases of exophthalmic goitre.

Drummond in discussing this subject called attention to the frequency with which the condition of hyperlymphatism was present in cases of exophthalmic goitre, and showed specimens from a recent post-mortem examination—the patient having died suddenly after operation—in which the lingual tonsil was much enlarged and the thymus gland nearly five times its normal size. This state, amounting to status lymphaticus, would often, he thought, prove to be the cause of sudden death after operation, and an attempt should be made to diagnose it.

Mamourian said that the longer *x*-ray treatment was practiced the more difficult was the operation for the surgeon. He thought it important that the question of dosage should be in the hands of the physician or surgeon and not in those of the radiologist. Local anesthesia was, in his opinion, the anesthetic of choice.

Tidy asked when exophthalmic goitre could be considered cured. He instanced cases in which exophthalmos persisted and the thyroid glands still remained large, but the symptoms otherwise had apparently disappeared. Tidy also read a communication from McCarrison dealing with the present trend of research regarding the origin of exophthalmic goitre.

Influence of Light in Prevention and Cure of Rickets.

HESS, in the *Lancet* of August 19, 1922, states that in order to ascertain whether it is necessary for the rays to impinge directly on the skin, some tests were carried out employing as filters cotton and woolen goods of various mesh, using the carbon arc lamp as the source of radiation. It was found that if this cotton fabric was interposed animals could be protected by three units of radiation, whereas if the material was somewhat heavier only slight protection could be accomplished with this intensity. White material permitted the passage of rays to a degree greater than black material manufactured by the same looms. Cotton and woolen stocking material, such as is commonly worn by infants, permitted but a small degree of the ultraviolet light to permeate unless very large dosage was employed. These experiments may be summarized by the statement that radiations must not necessarily impinge directly on the surface of the skin, but that there is—as might be expected—a quantitative relationship between the texture of ordinary wearing apparel and the degree to which it is pervious to the effective light rays.

Although we do not understand the mode

of action of the ultraviolet light, it has been found that a chemical change, which may be significant, takes place in the blood in the course of heliotherapy. Howland and Kramer found that the inorganic phosphate of the blood is almost regularly decreased during active rickets. In the course of treating rachitic infants with sunlight Hess and one of his assistants found that accompanying the calcification of the epiphyses there was an almost constant rise of the inorganic phosphate to the normal level. More recently this same return to the normal has been found to accompany the healing brought about by carbon arc irradiation. This increase was noted in a series of cases in which the blood phosphate had failed to respond favorably to daily doses of 2 g. of the secondary potassium phosphate. It may be added that in the form of rickets where the calcium of the blood is decreased radiation with rays from this source has brought back the calcium to its normal level. These effects are similar to those which follow the specific treatment with cod-liver oil. They are of interest in establishing a chemical basis for the employment of heliotherapy in rickets and definite evidence of metabolic change in the animal body brought about by the solar rays.

During the past year an analysis of the blood for inorganic phosphate has constituted one of the routine examinations carried out every month to ascertain the early occurrence of rickets. About 50 infants, varying in age from six to eighteen months, have been followed in this way throughout the winter and spring. Last summer the average inorganic phosphate content was 4.35 mg. per 100 cc of blood. In December, although the diet was unchanged and the hygienic surroundings the same, the percentage had fallen to 3.92 mg. It decreased steadily during January, February, and March. In April, especially in the latter half, it began to rise, with a further increase in May and a marked increase in June, which brought it to the level of 4.20 mg. per cent. These surveys represent some 300 individual tests. This seasonal tide of the blood phosphate, the ebb in the winter, and steady rise to the flood of summer-time, is to be attributed mainly to the seasonal variation of sunlight. It would seem that the ultraviolet rays are necessary for the normal metabolism of the growing infant, especially in relation to its exchange of inorganic salts. As stated, this tide occurred irrespective of diet, whether the infant received raw fluid milk or dried milk. It does not seem to occur regularly in adults, and was found to a less marked degree in older infants, in those ranging from 1½ to 2½ years of age—a period when the growth impulse has become less intense. There are, as far as he is aware, no comparable observations of an alteration in the chemical constitution of the human body varying from season to season. Some years ago Seidell and Fenger reported a marked seasonal variation in the percentage of iodine in the thyroid glands of sheep, beeves, and hogs. In general, about three times as much iodine was present in these glands between June and November as between December and May. It is too early to discuss the significance of this observation in infants. This deficiency of phosphate must exert an important influence not only on the nutrition of osseous tissue but on other tissues of the body. It is quite possible that, secondarily, it may play a rôle in the immunity or susceptibility to infection, and be a factor in the striking seasonal variation of infections.

It is impossible to appraise with any degree of accuracy the rôle of light in the incidence of rickets. This cannot be done until we know the nature of the dietetic deficiency or errors, and are able to view this aspect from a quantitative standpoint. The fact that the ideal diet, breast milk, fails to protect against rickets indicates that diet alone is not the dominant or controlling etiological element. In his experience one-half of the breast-fed infants of the poor of a large city show some signs of rickets by the end of March—the peak of the rickets season. This holds true only provided this seasonal time is observed, and if careful clinical as well as radiographic examinations are carried out. It occurs in babies

whose mothers are well nourished and have a liberal and varied diet. The conclusion must be that breast milk, although valuable, is provided with but a scant factor of safety against rickets, and that an additional protective influence is needed—namely, light. In London and New York the diet of the babies—the milk—is far more adequate and normal than the supply of light. It is a lack of sunlight which, in his opinion, brought forth the epidemic of rickets in the large cities of England which led to Glisson's classic investigation in the seventeenth century.

The Therapeutic Use of Germanium Dioxide in Anemia.

KAST, CROLL, and SCHMITZ, in the *Journal of Laboratory and Clinical Medicine* for August, 1922, state that the influence of germanium dioxide on red blood-cell formation has been studied in sixteen cases of anemia—four cases of anemia following hemorrhage, ten cases of secondary anemia, and two cases of pernicious anemia. In some of these cases the germanium was found to have distinct erythropoietic action. Whether this property shall prove to be of great therapeutic value in the treatment of the anemias remains to be shown by further careful study of more cases than are here presented.

Effect of Bismuth on the Kidneys.

DAY, in the *Lancet* of August 12, 1922, states that the specific effects of arsenic and antimony on spirochetal and certain tropical infections have prompted several investigators to test the properties of the metal bismuth, since the latter occupies a close position in the periodic scale of the elements. Sazerac and Levaditi have recently published an account of their researches which demonstrated the curative action of this metal on rabbits infected by spirochetal disease and on human cases of syphilis. Their observations have been confirmed and extended by the work of Fournier and Guenot. On testing the relative merits of various compounds of bismuth, Sazerac and Levaditi selected the tartrobismuthate of sodium as the least toxic. For use in man this compound was prepared according to Cowly's method and used as a 10-per-cent suspension in olive oil for intramuscular injection, the dose of the preparation being 2 to 3 cc. They established the important fact that soluble compounds of bismuth are at least ten times as toxic when administered intravenously as when given by intramuscular injection. Subcutaneous injections are, in general, less safe than intramuscular injections. Thus in the rabbit a dose of 50 to 60 mg. per kg. body-weight had no toxic effect when given intramuscularly, but an intravenous injection of only 5 mg. per kg. was fatal.

This recent work has confirmed former observations that the characteristic sign of bismuth poisoning in mild degree is the development of a dark line on the gums, very similar to that of lead. This may be associated with a gingivitis and in severe cases by a stomatitis, with discoloration and secondary infection by the organisms of Vincent's angina.

Before the above observations were published, Day had begun work on the same subject and encountered certain toxic effects following the intravenous injection of bismuth which are not mentioned in the articles quoted. The preparation he used was the liq. bismuthi et ammonii citratis (B. P.), which contains about 9 per cent of bismuth citrate. This was prepared as aseptically as possible and sterilized by heating it in closed ampoules (each containing 2 cc) at a temperature of 100° C. for over half an hour on three successive days. It may be mentioned here that Fournier and Guenot found this compound as efficacious as the tartrobismuthate in the treatment of syphilis, but that subcutaneous injections were liable to be followed by toxic effects.

Injections of 0.5 or 1 cc had no general bad effect, but on repetition a black line formed on the gums with sometimes a stomatitis, the condition resembling a mixed effect of lead and of mercury. But intra-

venous injection, especially when the large dose of 2 cc was given, gave rise to signs of poisoning. There was nausea or actual vomiting and slight diarrhea in a majority of the patients. But the most striking result was a copious diuresis, unaccompanied by strangury or other signs of vesical irritation.

Day gives two charts, the first one of which illustrates the effect on the urinary excretion in the case of a vigorous patient admitted for ascites due to hepatic cirrhosis (non-syphilitic). He exhibited a remarkable tolerance for the drug, which caused no gastrointestinal symptoms, and even begged for more intravenous injections, as the diuresis induced kept his ascites in check. The usual daily excretion of urine was 1000 cc and each injection of bismuth increased the day's output fourfold. There was no albuminuria, but a black line formed in the gums, with some gingivitis, which quickly subsided under treatment.

In two older patients a single intravenous injection of 2 cc was followed by signs of renal injury, very slight and transient in one case, but definite in the other. This latter patient, aged fifty-four, developed an acute tubular nephritis. On the fourth day the urine showed a heavy deposit of casts—chiefly epithelial—without blood corpuscles and but very few leucocytes, while albumin was present to the extent of 3 parts per 1000 (Esbach). After this date the condition rapidly improved, and by the tenth day there was the merest trace of albumin with a few hyaline and granular casts. At no time did any edema appear.

The action of bismuth was further tried on two cases of actual nephritis. In order to minimize toxic effects if possible, two small subcutaneous doses were first given in the hope that tolerance might be gained as with antimony. A larger dose (1.5 cc) was injected intravenously after a few days, no harm having resulted from the preliminary injections. In one patient, a case of acute nephritis associated with chronic bacillary dysentery, a definite diuresis lasting some days followed immediately on the intravenous injection, and his condition improved; in the other patient, a case of chronic nephritis, no change either for better or worse was observed.

To determine whether the citrate component of the drug used was responsible for the diuresis produced, several patients were given an equivalent amount of potassium citrate by intravenous injection. This had a distinct but far less diuretic effect than that induced by the bismuth compound.

The Effect of Intravenous Injection of Massive Doses of Adrenalin upon Skeletal Muscle at Rest and Undergoing Fatigue.

GRUBER, in the *American Journal of Physiology* for August, 1922, states that adrenalin injected intravenously has the same influence upon non-fatigued as upon the fatigued muscle. It lowers the threshold (increases irritability) and increases the height of muscular contractions.

Massive doeses of adrenalin (5 cc of a 1:100,000, 1:10,000, or 1:1000 solution) rapidly injected produced in his experiments an increase in some cases as much as 240 per cent in the height of muscular contraction in the fatigued muscle, and 100 per cent in the non-fatigued muscle, when injected intravenously in the intact animal. The increased height in the fatigued muscle was in some instances 33 per cent higher than that of the original initial contractions before fatigue.

The increase in the height of contraction is dependent, within limits, upon the concentration of adrenalin in the circulating blood, the rate of stimulation, and the condition of the animal.

The average duration of betterment in the height of muscular contraction was, in the fatigued skeletal muscle, 4 minutes and 40 seconds, 10½, 19½ and 9 minutes respectively from 1 and 5 cc of 1:100,000 solution, 5 cc of 1:10,000 solution, and 5 cc of 1:1000 solution of adrenalin rapidly injected intravenously. In the non-fatigued muscles the duration of betterment for

these same solutions was 4½, 12, 19½ and 24 minutes respectively.

Solutions of adrenalin injected slowly do not produce the prolonged betterments seen when the same solutions are injected rapidly.

The effects of adrenalin are only slightly, if at all, due to changes in blood-pressure or bettered circulation.

Adrenalin must be present in the circulating blood through the muscle at the time that the muscle is contracting in order to produce its best results.

Adrenalin does not neutralize or destroy the fatigue products but increases the irritability of the muscle whether fatigued or resting.

The Relation of Achylia Gastrica to Chronic Focal Infections and Pernicious Anemia.

LEVISON, in the *Journal of Laboratory and Clinical Medicine* for August, 1922, cites three cases, in each of which patients having foci of severe infections passed through the stage of an achylia gastrica and later pernicious anemia.

He states that the assumption that long-continued foci of infection may depress the gastric secretion and produce an achylia gastrica is justifiable, but there is no reason to believe, on the basis of any evidence yet brought to bear, that achylia in itself is a predisposing cause of pernicious anemia.

There is clinical evidence to believe that focal infections long continued may depress the functions of the bone-marrow and prevent the formation and development of new red blood cells.

It is urged that when achylia gastrica is discovered in a patient showing evidences of chronic focal infections the possibilty of the development of pernicious anemia be carried in mind with the view of insisting that all infections be removed in so far as is humanly possible. Achylia gastrica is used here in the sense of a depression of the gastric secretion with relation to HCl and not necessarily with complete absence of gastric ferments.

Rhus or Poison-ivy Dermatitis.

In an editorial on this subject in the *American Journal of Electrotherapeutics and Radiology* for August, 1922, it is stated that as a first step thoroughly cleanse the surface with a non-irritant soap or saline solution, then open the blisters (if any have occurred) and drain them, and again bathe the surface, after which apply the incandescent light for a period of one hour at a distance at which the skin will tolerate it comfortably; follow this with a thorough application of the static brush discharge, and apply a simple dressing of plain boric acid ointment upon a layer of gauze, over which place a thin layer of absorbent cotton and gauze bandage. After repeating this procedure for a few days the otherwise persistent trouble will be relieved.

This method of treatment has been in vogue long enough to have established its value. The long application of light, after the bathing, promotes an activity of the skin which results in the restored function of elimination. The application of the brush discharge still further removes the infiltration and exudation which is present in the tissues, acting also as an antiseptic. The dressing leaves the patient entirely free from the surface annoyance which otherwise is persistent.

Anesthetics and Analgesics in Labor.

GREENWOOD, in the Section of Obstetrics and Gynecology of the British Medical Association, the proceedings of which are published in the *British Medical Journal* of August 12, 1922, states that shock and exhaustion aggravated by pain and fear were the almost necessary accompaniments of every labor. Recent work had shown the profound effect of these factors upon the cells of the master tissues of the brain, liver, and suprarenals. Chloroform and ether given for a prolonged period not only did not give protection from shock, but actually intensified the very condition they were seeking to alleviate; they were actually prone to initiate and continue those cell changes of acidosis, and even the disintegration, which

they were seeking to avert. With scopolamine and morphine we are able to secure that most important consideration, brain rest, while at the same time permitting the essential labor organs to perform their function perfectly. By these means an ideal labor and a shockless operation could be attained. Greenwood then proceeded to enumerate the details of this technique, laying particular emphasis on the testing of the degree of amnesia obtained, and indicating what he regarded as the most important danger signs—analgesia, restlessness, and rapid pulse. These signs were the result of a faulty technique. He laid stress on the importance of regulating the dosage according to the individual patient. With a proper technique he had not met with any bad effects on either mother or child in a long series of cases.

Martin of Bradford stated that from the point of view of the general practitioner he had given up employing the scopolamine-morphine method in favor of a method of his own wherein he employed the continuous administration of small doses of chloroform by means of Junker's apparatus, combined with the repeated injection of small doses of pituitary extract.

The Wassermann Reaction in Syphilis.

This is a subject which has a close relationship to treatment. KILDUFFE, in the *Archives of Dermatology and Syphilology* for August, 1922, states that in spite of the enormous amount of literature which has accumulated, there are still clinicians willing to hazard a dogmatic statement on the results of a single Wassermann test on the blood alone.

While it is true that the Wassermann reaction is the most constant and delicate single symptom of syphilis, it has been abundantly proved, however, that in syphilis a single negative reaction is not sufficient nor definite evidence that a cure has been effected, for the disease may recur after treatment, at least to the extent that the Wassermann reaction reappears followed by clinical manifestations.

It is necessary, therefore, that successive examinations be made during a period of at least two years, and at intervals during the remainder of life.

The disappearance of Wassermann bodies from the blood of a syphilitic person with a consequent negative reaction indicates merely the cessation of interaction between the organisms and the tissues. A negative reaction only means that there are no foci of spirochetes sufficiently active to bring about the formation of a detectable amount of reagin in the blood; hence, "as an indication of complete removal of treponemata at a given moment a single negative Wassermann is useless. On the contrary, however, as an indication of failure to eradicate the treponemata, a positive Wassermann reaction has the greatest value."

In certain stages of syphilis the Wassermann reaction may be negative, at least for a time; on the other hand, the possibility of asymptomatic syphilis must be considered.

In the primary stages of syphilis only a small proportion of cases will react before the third or fourth week, and in those reacting early, the reaction is prone to be weak or to occur only with cholesterinized antigens, such reactions having been obtained as early as the tenth day.

In the initial stages the weaker reactions are of greater diagnostic value than in the later stages of the disease. After the third week following the appearance of the chancre, about 50 per cent of cases react positively with all antigens and about 75 per cent with cholesterinized antigens only.

In the secondary stage about 95 per cent of all cases are positive, and dependence should not be absolute on a single negative in this stage.

In neurosyphilis the blood Wassermann reaction may be negative while the spinal fluid is positive, a condition possibly dependent on the fact that the interchange of antibodies between the blood and spinal fluid is slow and, apparently, difficult.

Of late much attention has been paid to the incidence of neurosyphilis, and the

opinion is growing that syphilitic persons should not be released from observation until the results of examination of the spinal fluid are known.

This position is advocated by numerous investigators, among whom may be noted Gay, and Fordyce and Rosen, who call attention to the fact that the absence of clinical signs and symptoms does not exclude syphilis of the central nervous system.

In this connection the work of Jackson and Pike is of interest as pointing out that, in the presence of mental disease, a positive Wassermann reaction does not necessarily indicate its syphilitic origin and that syphilis may be merely coincidental. Their work also indicates that the diagnosis of neurosyphilis should be based on definite neurologic signs and spinal fluid reactions, irrespective of blood-serum readings. These observers note that neurosyphilis is rarely, if ever, superimposed on a well-developed psychosis.

Attention must also be called to the work of Thaysen, who has shown that in syphilis the Wassermann reaction may show wide variations from time to time, both as to degrees of positiveness and even as to its occurrence or absence without definite cause.

In the ultimate analysis, the clinical value of the Wassermann reaction is in direct proportion to the realization that it constitutes only a single method or phase of examination, and that it should always be carefully correlated with and interpreted in the light of all the other findings—however obtained—in the individual patient.

Vaccination Against Pneumonia.

FIELD, in the *Military Surgeon* for August, 1922, states that, including the enlisted men, he believes that the pneumonia vaccine as used at Fort Myer during 1921 gave positive results in lowering the incidence of respiratory disease, particularly during the continued exposure of an unusual winter in a personnel containing a large percentage of youths under six months' service.

He discounts the apparent lack of evidence in cases of tonsillitis and bronchitis, well knowing that in mild cases the term "bronchitis" is rather elastic and easily fits a required nomenclature, while tonsillitis occurs often as an exacerbation of a tonsillar focal infection, not easily demonstrated by a ward surgeon and not always checked by cultures if there is no suspicion of diphtheria.

As a result of this feeling on the part of the vaccinated group, and not because they like the actual inoculation, Field tells us that the commanding officer of the vaccinated group has already asked: "Can we be inoculated earlier this fall?" There still is a rivalry between vaccinated and control groups—there is competition—it is still a game.

The Treatment of Hemorrhage After Tooth Extraction with Turpentine.

STEADMAN, in the *Proceedings of the Royal Society of Medicine* for August, 1922, states that he has been using oil of turpentine as a local hemostatic for the past twelve years. During this time he has had about fifty cases in which sockets have required packing, and in the majority of them calcium lactate was not given as the bleeding was usually unexpected. In every instance the bleeding ceased within a minute or two of the packing.

Apart from its hemostatic action, oil of turpentine is a powerful antiseptic, so that when the gauze is removed two or three days after its insertion it still has a clean, faint smell of turpentine, and the wounds are very much cleaner than they usually are when they have been plugged. He would emphasize this fact, that the sockets are sweet and generally free from sepsis when the plugs are removed. The wounds heal very well indeed. He usually treats them for a few days by syringing with a weak solution of carbolic acid (1 in 80) in those cases in which he has been forced to pack a socket.

He regrets having to admit that his use of oil of turpentine in this way is purely empirical. He does not know how it acts

except that it lowers blood-pressure, but this obviously cannot be the full explanation. Oil of turpentine when given internally in the form of an emulsion to arrest hemorrhage from lung, stomach, bowels or uterus has been known to succeed when all other drugs have failed. It is possible that a course of this drug, given internally before tooth extraction in cases such as he has described, may prove to be even more efficacious than calcium lactate; or possibly both these drugs might be used with advantage and thus save the necessity of packing the sockets. But it must be remembered that the oil of turpentine given internally may produce irritation and congestion of the urinary organs, lumbar pains, distressing and ineffectual attempts at micturition, and even hematuria.

Violet Ray in the Treatment of Variola.

In the *Boston Medical and Surgical Journal* of August 10, 1922, ROMEO states that violet-ray treatment consists of exposure to the action of the ray as often as the comfort of the patient requires.

The lamp is kept distant from the surface of the body from five to nine inches, according to the tolerance of the patient.

He devised a way of giving patients the benefit of the ray, simultaneously, all over the body. Three lamps of 110 voltage each were placed on a stand so that the exposed surface extended from the head to the feet.

In this way one lamp radiated the face and the upper part of the chest and extremities; one lamp the abdomen and hands, and the other the feet and thighs. As soon as the patient felt too much heat, and could not bear that sensation any longer, he advised him to turn and expose the other side, and so until relief was obtained.

The lamps were kept from five to nine inches from the surface to be treated, but during sleep he advised keeping the lamp at least one and one-half feet away from the surface of the body.

A large sheet covered the apparatus in order to avoid dispersion of the rays. Good effects were also obtained by using an ordinary single lamp. The only objection he has to make is that one must constantly change the position of the single lamp so that all regions can be treated.

The benefit of the triple combination is greater, because the patient does not need to make any effort in moving the lamp, thus preventing fatigue.

Romeo concludes his article by stating that from the experience obtained in treating his three cases he believes that we have in the violet-ray a new and efficient weapon to combat the very distressing sensations caused by smallpox. Furthermore, a powerful agent has been found which, if applied before pustulation has occurred, will almost completely prevent the pockmarks.

It seems that the earlier the ray is used the shorter the course of the disease will be, and the constitutional symptoms will be milder.

Considering the great relief which appeared to follow this very simple agent and the inexpensiveness of its application, he believes that this treatment will soon become general.

So far as literature on this subject is concerned, he failed to find any article dealing with the treatment of variola by means of violet-ray.

Dangers to Health Arising from the Use of Industrial Preparations of Arsenic.

In the *British Medical Journal* of August 26, 1922, WILLCOX states that when arsenous oxide is used for industrial purposes it is frequently employed in combination with an alkali such as caustic soda or sodium carbonate, when the very soluble sodium arsenite is produced.

Industrial preparations include weed killers, which may be in the liquid or solid form. Liquid weed killers are strong solutions of sodium arsenite, and may contain from 14 to 40 per cent of arsenous oxide. The solution is usually colored by the addition of an aniline dye such as fluorescine, though during the war it was sold uncol-

ored. There does not appear to be any legal requirement to color the liquid preparations. Solid weed killers are on the market and are sold in tins as a fine powder, usually colored and containing a high percentage of arsenic. There would appear to be a legal requirement to color this preparation. An example of the solid weed killer is "Eureka weed killer," which was mentioned in the Greenwood case. A sample was found by Webster to contain 60 per cent of arsenous acid, and to be colored by phenolphthalein. The powder was very soluble in water, and formed a pinkish-red solution which was decolorized by acids.

Arsenical weed killers are most poisonous, and not only have often given rise to accidental acute poisoning, but there is reason to believe that they have been used for criminal purposes on many occasions. An example of several cases of accidental poisoning due to liquid weed killer occurred at Haslemere in April, 1920, when a sack of sugar absorbed a quantity of liquid weed killer from a leaky tin placed beside it during transit in a railway carriage. The consumption of the contaminated sugar gave rise to an outbreak of acute arsenical poisoning. About sixty cases occurred, but no deaths ensued. In the case of Rex v. Bingham (1911) three fatal cases of arsenical poisoning were the subject of inquiry, and these cases were undoubtedly due to poisoning by liquid weed killer. In May, 1921, an inquest was held on a woman named Hanktelow at Beckenham, where death was found to be due to acute arsenical poisoning. In this case the source of the arsenic appeared to be Eureka weed killer. In the recent Greenwood case (1920) and the Armstrong case (1921) both liquid and solid weed killers were the subject of careful investigation as regards the origin of the arsenic found in the bodies of the deceased persons.

Arsenical wood preservatives are on the market and consist of solutions of sodium arsenite which are not colored. In 1920 Willcox investigated an interesting example of the possible dangers of arsenical poisoning from the use of these preparations. An immense wooden hut in which 2000 girls were employed became infested with bugs, and in order to destroy them the interior of the hut was sprayed with a well-known wood preservative, and it was stated that the men who did the spraying suffered from "sores on the hands." The undiluted preparation was reported to contain 32.1 per cent of arsenic. A month after the treatment of the interior of the hut a white incrustation was observed on the surface of the wood, and this led to suspicion and an examination of its nature. A portion of the white deposit was scraped off and was found on analysis to contain 61 per cent of arsenous oxide. Dust from near the top of the roof of the hut contained 11.5 per cent of arsenous oxide, and dust from a file rack contained 3.6 per cent of arsenous oxide. The air of the hut at the level of the working tables contained an appreciable amount of arsenic (0.07 mg. per 100 cubic feet). It was obvious that there was great danger from ansenical poisoning to those working in the hut, and continued working under such conditions would be certain to be followed by an outbreak of arsenical poisoning. Prompt measures were taken for dealing with the arsenical deposit on the wood. Several washings of the whole interior with a warm solution of sodium carbonate followed by several washings with warm water were efficient in the removal of the sodium arsenite deposited on the surface of the wood. After this treatment it was found that the contamination of the air and dust of the hut with arsenic ceased, and it is interesting to record that not a single case of arsenical poisoning occurred amongst the occupants of the hut, and that their work did not have to be stopped while the cleansing processes were being carried out.

Careful statistics of illnesses which might have been due to chronic arsenical poisoning, such as gastritis, skin diseases, diarrhea, neuritis, etc., were kept during the whole period, and medical examinations were carried out, but no instance of arsenical poisoning was discovered.

Arsenical sheep dips are either solid or liquid preparations of a mixture of arsenous oxide and sodium carbonate or caustic soda; sometimes they contain sulphur in addition. The undiluted preparations contain a high percentage of arsenic, and numerous cases of accidental and criminal poisoning have occurred from them. The same risks apply as with weed killers. There is risk of chronic arsenical poisoning, such as arsenical skin rashes, to those who carry out the sheep-dipping process.

Fly papers are prepared by soaking bibulous paper in a solution of sodium arsenite, to which is sometimes added infusion of quassia. Fly papers usually contain from 3 to 7 grains of arsenous oxide per sheet. In the Seddon case analyses were made of fly papers from five different manufacturers, and percentages varying from 3.8 to 6.6 grains per paper were found in the different samples.

Sodium arsenite in solution, mixed with sugar or treacle, is used for moistening canvas sheets or screens in order to kill flies. This method was found of great service to the sanitary departments in the war.

An instance of accidental poisoning from sodium arsenite came to Willcox's notice during the war. In 1916 a cask of sodium arsenite intended for purposes of fly destruction lost its label, and some of the material was added to drinking-water in mistake for alum, the latter being necessary for the clarification of the turbid water, which was the only kind available for drinking purposes. The sodium arsenite had the effect of clarifying the water, but those who drank it suffered from symptoms of acute arsenical poisoning. Fortunately the symptoms were at once recognized and the supply of contaminated water stopped, so that no fatal case of poisoning occurred.

Arsenical powders, pastes, and liquids for destroying animals and insects are extensively used. The active principle of these is arsenous oxide. Thus "arsenic rat paste" is a mixture of arsenous oxide, bread-crumbs, lampblack, and glycerin. Arsenical rat powders are made with a mixture of arsenous oxide and flour, to which is sometimes added strychnine and barium carbonate. Arsenical mouse powders contain white arsenic, oatmeal, or flour, to which sugar or powdered cheese is added. Sometimes these contain strychnine in addition to arsenic. "Liquid arsenical ant destroyer" is a mixture of arsenous oxide, sugar, glucose, and water; and "arsenical ant paste" is a mixture of arsenous oxide, sugar, glucose, and flour.

Arsenical soaps and pastes, the active constituent of which is arsenous oxide, are used by taxidermists in the preservation of skins. Solutions of arsenic at one time had a reputation as cosmetics, and in the Maybrick trial this use was alleged as an explanation of the possession of arsenic by the accused. Arsenical preparations are not at present used for external application to the skin.

Arsenous oxide has been used by grooms and horse dealers for internal administration to horses in the belief that it improves the appearance of the coat. It is scarcely necessary to add that the unskilled use of this powerful drug is frequently attended by disastrous results to the unfortunate animals.

Arsenical preparations are most extensively used at the present time for spraying fruit trees in order to destroy harmful insects. Arsenous oxide and sodium arsenite are too destructive to the foliage of the trees to be of value. Insoluble preparations of arsenic, such as lead arsenate or calcium arsenite, are generally used, the liquid consisting of a fine suspension in water of the active substance. The combination of arsenic and copper, as exists in the preparation known as "Paris green" or "Schweinfurth green," is of especial value for fruit-tree spraying, since it combines the insecticide properties of arsenic with the fungus-destroying properties of copper salts.

Perhaps the arsenical spraying liquid in most common use at the present time is lead arsenate. It is prepared by mixing a solution of lead acetate with a solution of sodium arsenate in the required proportions,

and the fine suspension of the insoluble lead arsenate is used as a spray for fruit trees. The lead arsenate spray is applied by means of a spraying engine to the trees in the spring and early summer. A man using a spraying engine will be engaged in this occupation for several weeks, and in the process it is impossible for him to avoid the inhalation of the spray and to avoid its contact with his skin. Spraying is done before the leaves come out, and before the bloom comes, and also after the petals have fallen from the bloom. Willcox has reason to believe that poisoning from lead arsenate fruit-tree sprays is fairly common in districts where this method of treatment is in use. Two interesting cases of poisoning from fruit-tree sprays have been under his care where severe illness, and in one case a fatal result, occurred.

Surgical and Genito-Urinary Therapeutics

The Natural Limit of the Duration of Human Gestation.

OLIVER (*New York Medical Journal and Medical Record,* July 5, 1922) quotes a legal opinion to the effect that a normal case of uterine pregnancy may extend to a period of 331 days, this period being calculated not from the menstrual period or the failure of this to appear, but from the last day on which insemination by the husband might have occurred. He notes with surprise the persistence of the belief that fertilization usually takes place immediately after the menstrual period. He quotes the Jewish law which requires seven clear days after cessation of menstruation before having contact. He points out that the evidence is convincing to the effect that there may be fertilization as a result of a fruitful intercourse occurring at any time during the intermenstrual resting period from the seventh day to two days before the next menstruation.

The author rejects the theory that gestation follows immediately on fertilization, and notes that the skilful examiner cannot determine the incidence of pregnancy earlier than two weeks after the first missed menstruation, nor is morning sickness ever experienced until the first period is missed. This he regards as a sign of a growing germ plasma. He believes that gestation begins at a definite and fixed period, this regardless of the time of the fruitful intercourse. He holds that gestation begins invariably at the time when the generative organs begin to be activated for the occurrence of a menstrual period, which is inhibited because of the demands of a fertilized ovum.

Embryologists, therefore, in reckoning the age of any given human embryo, and in assigning dates to the various depicted stages of our embryonic development, will sooner or later be compelled by force of circumstances to make their calculations not from the date of cessation of the last menstruation nor from the alleged date of one insemination, but from the date on which the first missed period was expected.

When gestation occurs outside the uterus the fetus in its abnormal location may nevertheless attain maturity and be as perfectly nourished and developed as if it had been lodged in the uterus. If, however, it is not delivered by an abdominal section of the mother, before the natural limit of the duration of gestation is reached, it perishes. Fortunately and yet unfortunately it dies without a struggle and without the mother being in a position to throw any light upon or express any opinion as to the time when it probably perished. That it dies self-poisoned through a lack of oxygen there can be no doubt. We, however, are not altogether without circumstantial evidence as to the probable time when it perished.

After a normal pregnancy and parturition, if the mother makes no attempt to

suckle the child it not infrequently happens that the menstrual function reasserts itself about six weeks after the confinement, or, roughly speaking, about eleven and a half months after the date of the last menstruation in the case of a woman who is in the habit of menstruating every twenty-four to twenty-eight days. Now in some cases of full-time extra-uterine pregnancy, and while the infant is still located in the mother's body, we witness this same tendency for the menstrual function to reassert itself about eleven and a half months after the date of the last menstruation. This being so we may take it that so far as the reëstablishment of the menstrual function is concerned the normal removal of the practically mature infant from the uterus is an event analogous with the intramaternal death of the full-time extra-uterine infant. Judging, therefore, from what happens in cases of full-time extra-uterine pregnancy, it is quite evident that there is a well-defined natural limit to the duration of human gestation. If we would reckon scientifically and soundly we must reckon, however, from the time when gestation starts—*i. e.*, from the date on which the first missed period was expected. Reckoning from this datum statistical evidence supports the opinion that the limit of duration of human gestation is nine lunar months or 252 days. For the guidance of those practitioners who may continue to rely upon the customary and rough and ready methods of reckoning the probable date of parturition, I would observe that their allowance of ten lunar months holds good only in cases in which the menstrual cycle of the woman does not exceed that of one lunar month or twenty-eight days.

Xiphoiditis.

NARAT (*Illinois Medical Journal*, July, 1922) gives this pleasing title to a disease which he believes has not yet been described in medical literature. He describes the case of a man aged thirty-six, suffering from pain in the epigastrium, often of such severity as to prevent work, made worse by sour food. An operation was advised, to which the patient objected.

The physical examination revealed a tender xiphoid. This diagnosis the author holds was corroborated by a negative result of the examination of the stomach contents and of fluoroscopic and radiographic examinations. The pain disappeared in a few days under sodium salicylate. The man has remained well and has gained four pounds after having lost eleven.

The author states he has observed eleven similar cases in the last few years. He does not state that all of these eleven were simply, promptly and immediately cured by sodium salicylate.

The Meningiomas.

CUSHING (*West London Medical Journal*, July, 1922) uses the word meningioma to describe tumors apparently arising from the pachymeninx, and this without regard to the dominance of mesothelial or fibrous elements, or to the overgrowth of overlying bone or the shape of the tumor, or the presence of degenerative changes, or of psammoma granules.

These tumors have seats of preference, present a characteristic appearance, are not highly vascular, and seem to arise from the dura. The tumors may reach large size without symptoms of intracranial pressure.

From clinical material embracing 751 verified intracranial tumors—that is, tumors in which the lesion was histologically serviceable either at operation or autopsy—Cushing finds that 41.8 per cent were gliomas; 21.2 per cent were adenomas, chiefly pituitary; 11.3 per cent were meningiomas; and 8.4 per cent were neuromas (acoustic).

Thus these gliomas were four times as numerous as the meningiomas. These meningiomas are commonest in the fifth decade, are rare in youth and old age. They develop either in an irregular, lobulated form, or as flat areas spread over the inner dural surface. There is a tendency to cause hyperostosis of the overlying skull. The lesions are most frequent over the

frontal regions, both at the vault and base. They are not often recognized and may be difficult to locate unless their seat be indicated by hyperostoses demonstrated by the *x*-ray. As a result of his experience Cushing states that a few of these tumors have been accidental post-mortem findings in patients in whom brain tumor was unsuspected; three of them have been late post-mortem findings in patients who had been operated upon some years before for presumed tumor, but as this procedure revealed neither tumor nor tension the cases had been variously diagnosed as something other than tumor; in some of the cases (possibly ten) the growth, in the absence of localizing symptoms, was accidentally disclosed during the course of a subtemporal decompression; in the majority of the cases the presence of a tumor was obvious, and its location definite, but there is no preoperative statement in the case history to show that its nature was anticipated; in a few of the operated cases, not only was the location of the tumor evident, but a presumptive diagnosis was made of its character. This, of course, applies to all the latter examples of tumor with hyperostosis, as well as of several trigeminal, suprasellar and parasagittal lesions without osseous changes. Naturally, if one makes a diagnosis of meningioma in all patients with symptoms of brain tumor, he will be correct in about 10 per cent of his cases, but we should aspire to something far better than this low figure.

Certainly with our present knowledge of these lesions we should to-day, with a corresponding group of cases, be able to make a correct preoperative diagnosis in at least half of them. Small tumors such as those described by Schmidt as accidental post-mortem findings give no recognizable symptoms and have no surgical bearing unless they happen to impinge upon some important cortical area and provoke Jacksonian seizures. But the larger tumors, even when in silent areas, ought to be capable of recognition if chronology and duration of symptoms, age of patient, extracranial circulatory signs and the frequent hyperostoses are taken into account. Accordingly, it should be possible in an ever-increasing percentage of cases to foretell not only the situation of the growth, but to anticipate its character as well. This, in an operation so elaborate as one for brain tumor, is an enormous advantage.

There is no gainsaying that, despite the enucleability of these tumors, and even when they are easily accessible, the operations are often attended with great hazard, and, more often than for other tumors, must be done in two or even three sessions. One reason for this is that the growth, before its presence has been even suspected, may have attained a large size and through venous stasis have greatly increased the vascularity of scalp and bone.

There is to-day nothing in the whole realm of surgery more gratifying than the successful removal of a meningioma with subsequent perfect functional recovery, especially should a correct pathological diagnosis have been previously made. The difficulties are admittedly great, sometimes insurmountable, and though the disappointments still are many, another generation of neurological surgeons will unquestionably see them largely overcome.

An Effective Method of Treating Peritonsillar Abscess.

HOFFMAN (*American Journal of Surgery*, July, 1922) describes tonsillar abscess as a collection of pus usually placed above and to the outer side of the upper tonsillar pole, with the exception that there may be a number of pockets. The symptoms are usually sufficiently characteristic. The spraying of a weak cocaine solution into the nasopharynx will make the procedure needful less painful. This is followed by the application of cocaine crystals and adrenalin direct to the bulging mass formed by the anterior pillar. The tongue is then depressed and the angle of the junction of the anterior pillar and the tongue is exposed. The knife is introduced at this angle and carried upward to the upper tonsillar pole,

the blade penetrating at least one-quarter inch. A curved hemostat is pushed upward and backward about half an inch and the blades are separated. If pus is not encountered the hemostat is introduced in a slightly different direction. At times it must be introduced to a greater depth, where the purulent collection is close to the posterior pillar. The local anesthesia employed is sufficient to make the pain entirely bearable.

Varicose Veins and Ulcers.

HOMANS (*Boston Medical and Surgical Journal*, Aug. 17, 1922) contributes a valuable summary of this subject.

The operative treatment of varicose veins of the legs has never had a very good name. The palliative treatment requires a good deal of effort to accomplish very little. Many patients are able to enjoy life with no treatment at all. Routine operations will cure the average patient, but unusually careful treatment alone will secure the high proportion of good results which represents successful surgery.

Anatomically, the veins are the greater and lesser saphenous systems, which carry the returning venous blood from the superficial tissues of the lower leg. The great or internal saphenous vein collects tributaries from the front and inner side of the calf, and passing up the thigh as a large single trunk, empties into the femoral vein at the saphenous opening. The lesser or external saphenous drains the back and outer side of the calf and joins the popliteal vein in the upper part of the popliteal space. All the veins of the legs, like those of the arms, are furnished with bicuspid valves so set as to allow the blood to flow only toward the heart.

As a sort of safety vent for the surface veins a number of short vessels pass from the larger trunks in the calf to the deep veins which accompany the great arteries. To reach the deep veins these vessels necessarily perforate the fascia covering the muscles, and their valves are so set as to allow blood to flow only from without inward, that is, from the surface to the depth.

As to the deep veins, since they care for the very active muscles of the calf and thigh they must carry a considerably larger volume of blood than those of the subcutaneous tissues. They are quite capable of disposing of the surface blood when the superficial veins are disabled.

Physiologically, the means by which the blood is carried up from the legs to the heart is particularly interesting. There is, of course, a slow push from the capillary circulation. There is also suction from above, transmitted through the great abdominal vessels by the rhythmic pumping of the breathing and the action of the heart itself. But the force mainly responsible for sending the venous blood along lies in the action upon the vein walls of the muscles of the legs. The valves of the veins divide them into a series of chambers. Blood can pass up from one chamber to another, but never back. Therefore any muscular motion which compresses any segment of a vein will force blood into the segment next higher. With this mechanism the main channels are most concerned; for it they are particularly adapted, since every entering branch has a valve at its root, and thus none of the muscular energy is wasted in driving blood from the large veins back into their tributaries. It is easy to see that in comparison with the deep veins, the surface vessels are at a real disadvantage. The deep veins are surrounded by muscle or lie between muscle and bone. Thus muscular pressure is applied to them directly. The surface veins lie in the superficial fat outside the deep fascia and are covered only by the skin. Therefore their walls are less actively supported and the pressure by muscle contraction acts on them only because they are enclosed within the comparatively inelastic skin. It is doubtless to make up for this inferiority that the perforating veins of the lower leg are supplied.

If we consider that a varicose vein is simply one whose valves are broken, it is easy to understand how the wear and tear of life brings about the disease. The weight of the column of blood resting upon any one valve is something which it can bear

very comfortably, but let this strain be unduly prolonged, as in occupations which require long standing, or let it be magnified by anything which forces back the blood column, as in conditions of increased abdominal pressure, and valves are apt to give way. When the abdominal muscles are set, as in heavy lifting, there is added to the weight of the blood column above the topmost valve, in the case of the femoral or the great saphenous vein, this increased intra-abdominal pressure.

We start in life with fifteen to twenty valves in the main saphenous trunk from ankle to groin. There is usually additional protection in the presence of a valve in the femoral vein above the entrance of the saphenous. Since the great abdominal veins have none, increased abdominal pressure acts first on the topmost valve, and here the breaking down in all probability begins. Thus the occupations calling for heavy and sustained lifting are usually responsible for the varicose veins of men.

Varix may originate in two other ways. In some individuals of either sex it appears in youth or at the time of puberty, presumably on account of some malformation of the vein walls or of the valves themselves. But the most distressing form of varicose veins, the one most intractable to treatment and prone to ulcer, arises from phlebitis, such as the milk-leg after childbirth, or the phlebitis of typhoid fever. The infection and clotting are followed by a restoration of the main channel, but the valves are usually crippled and the vein walls thickened. Such veins, though small, are just as "varicose" as the large tortuous vessels which are so familiar.

As the valves fail the veins dilate, and the nutrition of their walls suffers. Scar tissue begins to replace their smooth muscle and elastic fibers. They become elongated and distorted. Thus tortuous and sacculated areas are formed. Even calcification may occur. In such veins the blood can pour down more easily than it can mount up, and until elevation of the legs enables it to pass along, or until it is slowly pushed up by the capillary blood behind, it stagnates.

Ulcer is the most common complication of varicose veins. To establish it an injury plus infection is necessary, but the stage is always set. The first sign of impending ulceration is usually the pigmentation which appears in larger and smaller patches upon the front and inner sides of the lower leg. This is the region of greatest stasis, since the long column of blood reaching to the heart is above it and there is not the free anastomosis with the deep circulation which is present in the foot. The appearance of pigment, which is often accompanied by a shiny atrophy, is evidence of the irritation due to poor nutrition. Only a scratch or a blow is necessary to establish an ulcer, for the badly nourished tissue almost inevitably becomes infected. The extent of the ulcer then depends upon the degree of malnutrition and upon the character of the treatment which is used.

The appearance of fully developed varix is so unmistakable that only the refinements of diagnosis are important in coming to a decision as to the treatment. Since the blood readily pours down a varicose vein, the simplest test of the loss of its valves is suddenly to lower the leg which has previously been emptied of blood by elevation. This is easily done by placing the patient in a rocking chair, raising the leg as the chair tips back, and asking the patient to stand up as the chair tips forward. The test was devised by Trendelenburg, the author of the position used so generally in abdominal operations upon the pelvis. The veins, of course, stand out tensely as the patient stands. But there is a very obvious refinement of this test which gives even more information. Before the leg is lowered, pressure is made upon the great saphenous vein in the thigh sufficient to prevent the flow of blood down it. When the patient stands, the vessels remain collapsed below the point of pressure and fill with a shock when the pressure is removed. This test is most conveniently carried out by passing a short length of gauze bandage about the

upper thigh. The ends of the bandage are held as reins are held in one hand in driving. A half twist of the hand gives sufficient constriction and release is easily made.

Suppose now that as the patient stands the constriction is not released but maintained. If then the veins are seen and felt to fill quite rapidly below the constriction, they obviously have not filled with fresh blood from the arterial circulation, since this is a slow process requiring perhaps three-quarters of a minute. Nor have they filled by downflow from above, since the bandage prevents it. Therefore they must have filled from the deep veins by leakage of the valves of the perforators which normally conduct blood only from without inward. This incompetence of the perforating veins indicates a greater gravity of the condition and is particularly important in planning the treatment of ulcer. For if, as sometimes happens, an ulcer lies directly over one of these vessels, and if at operation only the superficial veins higher than the ulcer are removed, the presence of the leaking perforator will continue to lead to stagnation of blood in the region of the ulcer and failure to cure. However, even in varix uncomplicated by ulcer the test may be valuable. The lesser saphenous vein perforates the popliteal space. Its branches on the back of the calf may, without showing much enlargement, communicate with the great saphenous. If it is varicose, it may alone be responsible for the filling of the surface veins below the constriction in the thigh. If early filling below the constriction is evident and varicosity of the lesser saphenous is suspected, the same test can be applied at the level of the knee. If constriction here now checks the filling below, the lesser saphenous is the leaking perforator and must be removed. It is not rare to find recurrences after excision of the great saphenous vein from failure to deal with this vessel.

Now to go back a moment. We have just followed the course of events when the superficial veins fill below the constriction upon lowering the leg, and we have seen that such filling indicates a leak into the surface vessels from the deep. If, on the other hand, the superficial veins remain empty for a half-minute or more after the leg is lowered, there is no such leak. We are then dealing with a pure surface varix, and the treatment even in the presence of ulcer is simplified.

The common type, of course, shows the large dilated, tortuous veins with which we are all familiar. The plexus of large veins is most evident on the inner side and front of the calf, but the tortuous channel of the main vessel is frequently noticeable in the thigh as well. In women, whose subcutaneous fat is more abundant than that of men, the varicose vessel in the thigh is frequently palpable rather than visible. In that case its position may be detected by locating the impulse set up by tapping the tense veins of the calf, a procedure known as the Schwartz test. In men, however, the great saphenous vein is usually visible up to the saphenous opening, where a large sacculation is often present. Of this familiar type it may be said that the worse it looks the easier it is to treat. For while the varicose condition of the principal superficial vessels is gradually becoming established, there is usually developed sufficient compensatory circulation outside the great saphenous system to keep the skin well nourished. The perforating veins are usually competent.

The contrast to the common type is seen when varix arises after a phlebitis or when phlebitis attacks veins already more or less varicose. In such conditions the surface veins are often so scarred and shrunken as to be invisible. They may usually be palpated, however, as hard cords. Such dilated surface veins as may be evident are not the principal channels but distended tributaries ordinarily insignificant. Often it is not the visible veins which call attention to the disease, but the ulcer or ulcers which almost invariably complicate it.

Apparently two factors contribute to the formation of ulcers in these unfortunate

patients. One is the quite general infection of the calf which accompanies the phlebitis and leaves the tissues badly scarred and poorly nourished. The second is the very common involvement of the perforating veins in the phlebitic process. Stasis and malnutrition are therefore magnified. Ulcers are common, often diffuse, and occasionally multiple. It is in this type of varix that the constriction test most often discloses rapid filling below the constriction. The test must often be made more by the sense of touch than by the sense of sight, since the surface veins are so often sclerosed and inconspicuous. In some instances the filling of the veins on standing is equally rapid, whether the main vessel in the thigh is free or compressed.

A word about palliative treatment. This consists in so compressing by bandages the dilated surface vessels that they are kept emptied of blood. In this way the patient's sense of fulness and tingling is relieved and the blood is actually forced into channels capable of carrying it toward the heart. Efficient bandaging, and by the word I mean to cover the use of elastic or canvas stockings as well as of gauze and flannel rollers, may prevent the development of ulcer and will usually cure it when present. Soap and water cleanliness of a varicose leg is an indispensable accompaniment. The particular ointment applied to the ulcer is far less important than the pressure of the bandage. And in any case, no bandage, however efficient, can approach the effect of rest in bed.

If a varicose ulcer must be treated in the ambulatory manner, a most satisfactory arrangement is the use of the so-called "jelly" bandage. This consists of several layers of ordinary gauze bandage permeated with Unna's paste. An excellent formula for this paste is:

Zinc oxide, 10 gm.;
Gelatin, 40 gm.;
Glycerin, 120 cc;
Water, 150 cc.

The gelatin is dissolved in hot water by heating.

Mix the zinc oxide with the glycerin. Put all ingredients together and let stand until hard, occasionally stirring. In hot weather the gelatin may be increased at the expense of the glycerin.

To be used, the paste is heated on a water-bath until it liquefies, and is then applied as follows: The leg, which has been elevated for some time, is painted from toes to knee with the liquid paste. To this surface a smooth layer of gauze bandage is applied. Upon this a second painting of paste is laid, and in this way three or four layers of bandage impregnated with paste are smoothly fitted to the leg. The heel is not included. After a few hours of drying the jelly bandage is comfortable, flexible, and very durable. It may remain in place for several weeks. The ulcer, if small and little infected, may be directly and permanently covered, but it is usually wiser to cut a window over it for the purpose of making local applications. The jelly bandage can also be used with advantage in convalescence from operation, especially when the patient is first getting about. In general, it may be said that though this particular dressing requires some practice and skill in application, it is far superior in every way to ordinary bandaging.

Operative treatment aims to do away altogether with varicose veins. To be successful it must permanently break the column of blood between the great abdominal veins and the superficial circulation below. It only removes what is worse than useless, the varicose channels down which blood has been pouring to increase the labor of the deep veins. The work of the latter, far from being increased by excision of the varicose surface veins, is thus actually lightened. In carrying out the operation one should bear in mind, first, that the great saphenous vein must be most thoroughly eradicated at its upper end; second, that all wounds must heal perfectly; and third, that ulcers must be so treated that they cannot recur.

Recurrence after operation comes most often from a reëstablishment of connection between surface veins remaining in the leg

and the stump of the great saphenous. Therefore the vein must be tied and divided close to the femoral, and the several small branches which enter it in this region, both from above and below, must be disposed of as well. This is most conveniently done through an oblique incision several inches long just below and parallel to Poupart's ligament. From this point on the main channel may be stripped or excised by open dissection to a point below the knee. To all intents and purposes this is the whole operation. The removal of the distended veins of the calf, once all danger of back pressure from above is at an end, is only essential when incompetent perforating veins have been shown to be present.

Wounds of even normal legs heal perhaps a little less well than those of less dependent parts. Wounds of varicose legs are at a still greater disadvantage. Therefore if operations are to be uncomplicated by sloughing and infection and to lead to quick and complete healing, the tissues must be handled with the greatest gentleness and cleanliness. Incisions should always be carried down cleanly to the deep fascia. The skin edges should be held open with retractors and not continually seized with forceps. When a tortuous adherent vein is to be removed, it is better to turn up a thick flap and to remove the vein from underneath it than to follow the vein from the surface.

The System of Applying Local Anesthesia.

FARR *(Illinois Medical Journal,* August 1922) observes that the percentage of operations which a surgeon may find himself prepared to perform under local anesthesia will depend largely upon his training and equipment, and possibly somewhat upon his temperament. The latter will, however, as a rule, undergo rather rapid metamorphosis as his skill increases.

His success will depend largely upon three factors: first, the technique of the application of local anesthesia; second, upon the application of a surgical technique compatible with the use of local anesthesia; and third, upon his willingness to give heed to the special attention which is every patient's due in looking after the minor details which govern the comfort of the patient during his sojourn in the hospital.

Novocaine in weak solution may be used in sufficient quantity to thoroughly interrupt the nerve supply to any operative field with comparative safety to the patient. The establishment of anesthesia then depends upon one's ability to reach the nerve supply of the parts. In the case of the cerebrospinal nervous system the nerve supply may be reached by a direct infiltration or by conduction anesthesia. The sympathetic system, situated as it is, is somewhat more difficult to reach. The ideal method of interrupting the cerebrospinal nerves is, of course, at or near their origin, and had not this method certain disadvantages it would be the method of choice. However, intraspinal anesthesia, paravertebral anesthesia, and other forms of nerve block requiring much skill and experience will long remain in the hands of the experts. Practical local anesthesia on the other hand, as exemplified by infiltration and infiltration block, lends itself quite readily to the use of the surgeon with but a moderate amount of training in the art of local anesthesia, and this form of anesthesia is perhaps destined to become the most widely accepted.

The development of a surgical technique which is compatible with the use of local anesthesia has made slower progress, and its use will in the future depend much more upon the development of such a technique than upon the improvement in local anesthesia methods. The greatest problem relates to intraperitoneal surgery, and in no field is the dictum laid down above more true than when working within the abdominal cavity.

While the development of splanchnic anesthesia by the posterior route may be said to give excellent intraperitoneal anesthesia, its establishment has certain disadvantages which will keep it out of the hands of the general surgeon for a long period. Likewise the anterior splanchnic

anesthesia of Wendling will be slow of acceptance. The anesthesia of Braun, who introduces a hand through the abdominal incision and palpates the bodies of the vertebræ before applying the splanchnic method, is of a more practical nature, but it is by no means a simple procedure. For these reasons we have attempted to develop a form of strategy to meet the demands of abdominal surgery under local anesthesia and to simplify the anterior splanchnic technique of Braun.

The development of this strategy is predicated upon the hypothesis that the splanchnic nerve supply may be interrupted wherever it can be exposed. A successful system therefore in carrying out surgical procedures within the abdomen or in establishing anesthesia in this region demands an adequate exposure. This we obtain by first establishing a perfect anesthesia of the abdominal wall, which abolishes the reflexes and presents relaxed abdominal parietes. In direct relation to this there is a demand for the absence of expulsive effort on the part of the patient—a condition which we have chosen to call negative intra-abdominal pressure—making visual rather than digital abdominal exploration possible.

An exposure is obtained by a rigid compliance with the above mentioned demands and is further facilitated by the use of elastic lateral and vertical retraction of the abdominal walls, tilting of the patient's body in order to obtain advantage of the force of gravity, perfect illumination of all intraperitoneal pockets, and an appropriate surgical technique which permits one to deal with the offending organs in their normal habitat, rather than to dislocate them and bring them out upon the abdominal wall before dividing their peritoneal attachments.

Complicated intraperitoneal work also demands the establishment of splanchnic anesthesia, and by means of the foregoing strategy we have been able to establish anterior splanchnic anesthesia in a vast majority of cases. Its establishment depends entirely upon exposure and is facilitated by proper equipment. In the upper abdomen the splanchnic area is reached in the region between the liver and the duodenum, and by making use of the coöperation of the patient one may readily inspect this area in some cases. In the pelvis the splanchnic nerves may be interrupted at the pelvic brim or in the broad and round ligaments. It is entirely a matter of exposure.

Assuming then that a fairly definite preoperative diagnosis has been made, the strategic points which we have found of most service in dealing with intraperitoneal lesions are as follows:

A position upon the table which allows the patient the maximum of physical comfort.

Restraint of the patient without constriction.

The induction of local anesthesia without the production of pain.

The making of a properly planned incision without the excitation of a combative action on the part of the abdominal muscles. This demands perfect anesthesia, elevation of the abdominal wall while incising, elastic retraction of the wound, and feather-edge dissection.

Tilting of the table so that the force of gravity may be employed in exposing the intraperitoneal field of operation.

The establishment of an anterior splanchnic anesthesia.

The carrying out of the operation within the peritoneal cavity without the dislocation of the abdominal tissues, by which method traction may be avoided.

Visual rather than digital exploration, obtained by proper retraction and illumination.

The adjuncts in equipment and technique which aid in meeting this ideal are:

A table upon which provision is made for universal tilting.

The use of elastic retraction, which is offered by the use of the wire spring retractor.

The use of long, delicate instruments, bacteriologic technique, and the forceps tie.

The presence of a psycho-anesthetist at the patient's head, through whom coöperation on the part of the patient is obtained.

The pneumatic injector furnishes one with a constant supply of solution under a definite, fixed pressure, making it possible to induce anesthesia in a minimum time with a minimum of exertion, and with but slight possibility of missing any portion of the field which is to be infiltrated. For intraperitoneal work this instrument allows one to reach with the needle point any desired locality without the hand obstructing the line of vision, an exceedingly important point when one is attempting to anesthetize sensitive areas in deep cavities.

Intrameningeal Hemorrhage of the New-born.

BARNETT (*Northwest Medicine*, August, 1922) observes that meningeal hemorrhage is responsible for the heavy toll of physically and mentally debilitated children classified as having Little's disease. The degenerative processes secondary to hemorrhage can produce epilepsy and various degrees of mental defectiveness.

Some statistics have given the immediate mortality as high as 60 per cent. A bad prognosis is indicated by deep asphyxia, from which it is necessary to revive the infant artificially, usually under difficulty. The prognosis is always serious, when the hemorrhage produces symptoms within the first few days of life.

An immediate diagnosis is often difficult. Focal irritations and a blood-stained spinal fluid are definite signs. It is usually safe to make a presumptive diagnosis on such signs as pallor, restlessness, refusal to nurse, facial edema, cephalic cry, while a positive diagnosis is made if they are followed by convulsions.

Evidence that the hemorrhage has occurred or progressed because of hemorrhagic disease of the new-born is furnished by finding the coagulation time and bleeding time prolonged above the normal. Duke's method is used to obtain the bleeding time. The heel of the infant is sponged with ether and a small puncture is made with a sterile lance blade or scalpel to produce a free flow of blood without the slightest pressure. At half-minute intervals the blood is blotted on absorbent paper. This gives a series of blots of gradually decreasing size. Each blot represents one-half minute's outflow of blood. The rate of decrease in the size of the blots shows the rate of decrease of the hemorrhage. The total duration of such a hemorrhage is called the bleeding time. The normal bleeding time has a range from two to five minutes.

Rodda's method of obtaining the coagulation time is easily carried out. Two one and one-half inch watch-glasses and a No. 6 lead shot are required. Glasses and shot should be thoroughly cleaned. The puncture is the same. A clean watch-glass is inverted over the first. The watch-glasses are gently tilted every thirty seconds until the shot no longer rolls, but is fixed in the clot. The end result is sharply defined; the shot is firmly embedded, so that the glass may be inverted without dislodgment of the shot. The time is reckoned from the time the first drop falls. The average time is seven minutes, with a normal range from five to ten minutes.

The coagulation time and bleeding time of the blood should be determined in every new-born presenting cerebral symptoms. If these are delayed, human blood should be administered.

The subcutaneous use of whole blood has the advantage of easy application and absence of the necessity of blood grouping. By its use hemorrhage can be controlled and at the same time the disturbed coagulation factors return to normal. Its disadvantages over transfusion are that it does not relieve the profound anemia and that it may be necessary to repeat it to control bleeding. From 15 to 25 cc of blood should be used at each injection, which may be repeated as often as twice daily.

Chloral and bromides may obtain additional quiet, prevent crying, and stop convulsions. It is important that the infant be not allowed to cry, because it produces increased intracranial pressure which may detach the clot or cause oozing around it.

To prevent aspiration of food nasal catheter feeding may be necessary.

Spinal puncture may have a therapeutic as well as a diagnostic value. It has been advocated to repeat it daily until the fluid is free from blood.

Fontanel puncture is considered a more efficient procedure than spinal puncture. Aspiration of the subdural space is best made at the lateral angle of the anterior fontanel. The needle is introduced in a direction almost parallel with the skull. It may be carefully swept in various directions, if blood is not immediately obtained; care must be taken not to cross the middle line to avoid injury to the falx or longitudinal sinus.

Operative interference is especially justifiable in subdural hemorrhage in the anterior fossa of the skull, providing little or no blood has been obtained by fontanel puncture. It should be performed early before paralysis appears and as soon as the progressive character of the symptoms of intracranial pressure has been indicated. Surgery should be controlled by blood studies and the further use of whole blood if necessary, in order that the operation may not be undertaken in the face of the danger of uncontrollable hemorrhage.

Minor Displacements of the Coccyx.

CYRIAX (*Glasgow Medical Journal,* August, 1922) notes that minor displacements of the coccyx are rare after middle age. They are commonest in females and are usually due to direct violence. Nor do such displacements occur without traceable cause, the author holding that when a distinct history is absent it will usually be found that in those of sedentary habits incident to long sitting the bone has probably been pushed out of place. The usual displacement is forward, at times associated with a tilting. The sacrococcygeal joint is subject to the inflammations common to all joints, and as a result of this adjacent nerves may be affected, particularly the sacrococcygeal and the coccygeal ganglion.

The symptoms are analogous to those of minor displacements of bones elsewhere. In a few cases there may be none at all, though pain is usually experienced, and may be either constantly present or may only arise when the sitting posture is assumed, especially if this be done on a hard seat. The pain is usually aggravated by traveling in motors and trains, and is often increased during defecation, sometimes to such an extent that the patient dreads having rectal evacuations, and constipation ensues. The resultant overloading of the rectum, with perhaps the ensuing necessity to strain at stool, may act in a vicious circle with the nerve irritation. In order to avoid pain, the patients often sit sidewise on a chair, frequently continually changing so as to rest alternately on each buttock. In more than one case I have known the patient to have a chair specially constructed so as to remove all pressure in the middle line. In severer cases even this may be insufficient, and relief from pain is only obtained by lying down on one or other side.

Pressure over the joint when applied as if to increase the deformity nearly always increases the pain, but may relieve it when administered in the opposite direction. Palpation of the bony margins adjacent to the joint may show undue projection of the lower edge of the sacrum or the upper edge of the coccyx, as the case may be, and an abnormal amount of separation is detectable in major degrees of forward tilts. Attempts at passive movements of the joint may elicit coarse grating sounds, and nearly always induce pain, especially when such movements increase the amount of displacement.

Constipation is occasionally present; this is probably also in part due to the displacement causing pressure on the coccygeal ganglion, which is motor for portions of the large intestine. Various reflex pains may arise, the commonest being sciatica. In two such cases pressure upon the coccyx, as if to increase the deformity, caused great increase in the sciatica as long as the pressure was maintained. In two other cases a

similar pressure caused a feeling of nausea, though there were no digestive anomalies.

In the case of displacement *en masse* without tiltings, the principles of treatment are on the same lines as for displacements elsewhere, namely, reposition, followed, when necessary, by mechano-therapeutics. Reposition is generally quite easy unless large numbers of adhesions have formed, and is practically painless; I have never yet had occasion to employ anesthetics. As a preliminary to reposition, it is highly advisable to obtain relaxation of the joint area. This is best effected by means of manual vibrations applied during the space of a few minutes, either over the posterior surface of the bone or simultaneously over both anterior and posterior surfaces, the thumb being placed over the posterior and the forefinger over the anterior surface of the bone, either through the perineum if it is sufficiently yielding or else per rectum. The bone is then grasped with the forefinger and thumb, and gently moved alternately backward and forward, and, if needs be, also from side to side, with gradually increasing range. Then with a sudden movement the bone is replaced. The reposition is generally attended by a sound similar to the one that occurs with reposition of bones elsewhere, and immediate amelioration of symptoms is generally the result. Amongst unusual ones thus improved may be mentioned pain in the anterior tibial nerve remaining after great improvement in sciatica; difficulty and pain when walking from arthritis of the hip-joint; difficulty with micturition.

Sometimes reposition *per se* will effect a cure, no further treatment being required. This, however, applies only to simple cases of recent date. In most others it is generally advisable to give a few days' treatment of mechano-therapeutics, consisting of manual vibrations over the coccyx, followed by passive movements of flexion and extension of the affected joint with a few resisted exercises for the gluteal muscles.

In the case of tiltings, when combined with displacements they can often be corrected simultaneously with reposition of the bone. When tiltings exist *per se*, they are to be treated by gradual stretching of the shortened ligaments, together with stretching or rupture, as the case may be, of any adhesions, just as with contractures elsewhere.

Intravenous Injections of Hexamethylenamine.

FRIENDLAENDER and COWEN (*International Journal of Surgery*, July, 1922) have made intravenous injections of hexamethylenamine in 142 cases.

Hexamethylenamine was used in the treatment of the septic bronchopneumonias following influenza, during the epidemic of 1918 in the United States army, in Camp Dodge. The method of Loeper and Grosdidier was followed, injecting a 4-to-1000 solution of hexamethylenamine intravenously, with constant results, except that a desire to urinate was noted soon after the injection in practically every case. At first it was attributed to the saline intravenously, but after trying the saline alone the final conclusion was reached that it was due to the hexamethylenamine.

It is a well-known fact that hexamethylenamine, when brought into the circulation, is split up and liberates formaldehyde. It remains in the circulation for a comparatively long time, is distributed through the body secretions, and eventually excreted by the mucous membranes of the body.

Information from reliable sources indicates that human beings tolerate a larger and more concentrated solution of hexamethylenamine if given intravenously than if administered by mouth. O. Sachs and the authors have given 30 cc of a 40-per-cent solution without any injurious after-effects.

Ymaz and Ayerza, in their article on hexamethylenamine by vein in typhoid, state that a physiologically isotonic solution is made by dissolving it in a 4-per-1000 salt solution. The preferable concentration seems to be a 30-per-cent solution in the 4-per-1000 saline. If heated too much the solution becomes hemolytic, but this does

not occur when it is heated merely to 70°C. for three hours in all, an hour at a time.

This remedy has proven repeatedly very efficacious in the treatment of 142 cases of dysuria and retention of urine. Five cc of a 40-per-cent sterile solution given intravenously eight to twelve hours after an operation or after parturition has always brought the desired results. The objection that the patient would have probably voided anyway is not well founded. It has been tried out, allowing patients to be catheterized several times, using the remedy as outlined above, and eventually, after patient and nurse were exhausted, normal urinary function was established by one single injection. Seldom has it been found necessary to repeat the dose, although there is no objection to doing so if thought desirable. Never has there been hematuria or any other bad after-effects resulting from giving this remedy intravenously. It can be administered with safety to patients with an ordinary albuminuria.

When used intravenously it seems to have a sterilizing effect on the urine, which is a great advantage after vaginal operations or parturition, especially if the patient has been suffering from an old cystitis.

E. Vogt and O. Sachs, who have given a great deal of attention to the intravenous action of the hexamethylenamine on the bladder innervation, came to the conclusion that the formaldehyde excreted with the urine causes a local irritating effect on the part of the parasympathetic system supplying the bladder, thereby inducing a contraction of the vesical detrusor and a relaxation of the vesical sphincter, or sphincter trigonalis, thus favoring an emptying of the bladder.

Hexamethylenamine, properly sterilized, prevents hemolysis, and is perfectly harmless given intravenously in a 40-per-cent solution, 5 cc. The dose may be repeated two or three times during twenty-four hours.

It has a decided effect on urinary retention and dysuria, and probably a diuretic effect may be claimed.

Intravenous administration of hexamethylenamine is followed by a rapid excretion of formaldehyde directly by the kidneys in appreciable quantities before entering the bladder; and formaldehyde appears in acid and neutral urine.

Concomitant intravenous administration of phenolsulphonephthalein solution does not interfere with nor retard the excretion of formaldehyde, nor interfere with the test for formaldehyde in the urine. Formaldehyde excretion is much more rapid than is that of phthalein or methylene blue.

Free formaldehyde is found in the blood stream by the most delicate test available after the intravenous administration of hexamethylenamine solution; it could be demonstrated one-half hour after the injection. Blood within or outside the body apparently splits up hexamethylenamine into free formaldehyde.

Formaldehyde is eliminated in the saliva following the intravenous administration of the hexamethylenamine.

Neuropathic Dilatation of the Colon, with Hypertrophy.

WINSLOW (*Northwest Medicine*, August, 1922) reports a case of megalocolon in a man sixty-eight years old, who suffered from diarrhea and distended abdomen and experienced no help from the rectal tube, enemata, and paraffin and cathartics. The sigmoid, which was six inches in diameter and greatly thickened, was resected. The patient died of pneumonia two days later. Winslow remarks upon the peculiarity of this case in that it affected an old man. Megalocolon is usually observed in children and young adults.

The dilatation affects mostly the sigmoid, but may involve the whole colon or, rarely, the small intestine. There is compensatory hypertrophy with thickening of the gut, so that it may form a non-collapsible tube a quarter of an inch thick and as much as six inches in diameter, looking something like a large-sized automobile tire.

The etiology is uncertain, but the most probable is a neuropathic origin, as in cardiospasm, with a spasm below the affected segment and dilatation above. Innervation of the colon is derived from hypogastric plexus with motor and inhibitory spinal and sacral fibers, while impulses may originate in the neuromuscular nodes in the gut itself. Whether the disordered innervation is one of paralysis of motor impulses or stimulation of inhibitory is unknown.

Clinically we may divide cases into four groups:

The congenital in the new-born without fecal movements but with distention of the abdomen, autointoxication, inanition, and, from upward pressure, dyspnea, cyanosis, and respiratory failure. The treatment consists of dilatation of the sphincter ani, abdominal massage, and irrigation of the bowel.

Cases occurring during weaning with chronic tympany, constipation, and cachexia.

Cases observed in males in late life with marked chronic tympany and constipation, often alternating with diarrhea.

Extraordinary tympanites without particular pain or tenderness, vomiting, or muscle rigidity. Visible peristalsis and segments of intestines may sometimes be observed. Due to pressure upwards on the diaphragm, there are often absence of liver dulness in front, displacement of the heart, dyspnea, together with cyanosis and marked distention of the lower belly.

X-ray in knee-chest position after a barium enema is essential. Differentiation from partial obstruction by growth or volvulus of sigmoid is made by absence of pain, vomiting, and usually absence of visible peristalsis (not always), and passage of flatus and feces in megalocolon. From peritonitis the absence of causative history, vomiting, tenderness, rigidity, rapid pulse, facies, prostration and dulness in the flanks in megalocolon are the chief distinguishing points.

The prognosis is bad without operation.

Medical measures are ineffective except in mild cases. They include purges of castor and paraffin oil, rectal irrigations, use of rectal tube, and abdominal massage.

Surgery is best carried out by a three-step operation. First, the making of an artificial anus well above the dilated bowel; second, enteroanastomosis between the segments above and below the dilatation; third, resection of the dilated segment and closure of the colostomy opening.

The Rat and Human Disease.

RILEY *(Minnesota Medicine,* Volume V, No. 8) after quoting an estimate to the effect that the United States loses $35,000,000 a year by the depredations of rats, calls attention to some of the ways in which this rodent affects the health rather than the pocketbook of man. He observes the rat may be an accidental carrier, or a natural host. Attention is called to the rats' favorite gathering places—privies, drains, garbage and manure heaps. Nor are they particularly cleanly; moreover they are most likely to spread ptomaines and various destructive molds and other fungi. As carriers they may be expected to contaminate food eaten by man if so left that they have access to it. It is generally recognized that the rat is the main disseminator of bubonic plague, using as a special agent the flea.

Moreover, Weil's disease, or spirochetal jaundice, can be justly attributed to the rat, the organism having been found in the urine of this animal and in the urine and kidneys of the wild rats in Japan.

The infecting agent of "rat-bite fever," characterized by long duration in a relapsing form, is found in the mouth of the rat and develops at times after a rat bite. The causative agent is the *spiroschaudinnia morsusmuris.*

Riley states that the epidemic diseases of rats at times artificially induced for the purpose of clearing them out, and simulating paratyphoid fever, may not be entirely harmless to man.

Favus attacks rats and mice as it does also man, the disease being reached through the rat at times by the medium of the cat.

Pathogenic amebæ are found in rats which closely resemble the entamebæ of man. Indeed the entameba dysenteriæ of man will infect rats. The flagellate protozoan parasites *giardia intestinalis* (Lamblia) and trichomonas intestinalis are apparently identical with those found in the rat. Moreover, the rat harbors at least two species of tapeworm transmissible to man. One of them, the commonest found in man, the dwarf tapeworm, because of its small size has generally been overlooked, as it is not more than 10 to 15 mm. in length.

Hymenolepis nana is able to complete its development in a single host. The egg develops into a cysticercus in the villi, and this larval form transforms into the adult tapeworm in the lumen of the intestine of the same host.

The largest specimen of tapeworm, the *hymenolepis diminuta,* is extremely common in rats. Insects are its intermediate host, often the rat flea. It is rare in man, affecting when found infants and children.

The author regards rats as the chief carrier of trichina and considers them as the normal hosts. He seeks his specimens by trapping rats about slaughter-houses. He has found as many as 60 per cent infected. He quotes Stiles to the effect that the disease will never be eradicated until the rats and mice are exterminated.

Another nematode worm, *syphacia obvelata,* closely related to the oxyuris vermicularis, may be transmitted from rats to man.

Gonorrhea in Women from the Aspect of a Focal Infection.

LANGSTROTH (*New York Medical Journal and Medical Record,* July 5, 1922) states that even prophylactic measures in women are practically valueless. He holds the same opinion in regard to laboratory test as bearing on the diagnosis of chronic gonorrhea. He places most dependence on the history, and states that once infected every woman sooner or later acquires a secondary infection of the cervix; and that this infection is as potential in producing ill health as is the local infection, for instance, of the tonsils or teeth.

In the early stages of the infection he advises the use of permanganate irrigations, or the application of argyrol solutions. He also advocates the use of autogenous or stock vaccines. The acute tubo-ovarian and pelvic conditions complicating this disease usually get well of themselves.

As to chronic gonorrhea in women, the author believes that medical treatment is extremely limited in its usefulness, being mostly futile. Surgery he believes holds out the only promising cure. The surgical procedures he advises are the removal of the involved Bartholin glands; the destruction by cautery or knife of Skene's glands and complete removal of the cervical epithelium from the external to the internal os, the cervical canal being relined with a flap taken from the vagina or the cervix.

The Action of Flavine Antiseptics on Localized Pyogenic Infections.

BENNETT, BLACKLOCK and BROWNING (*British Medical Journal,* Aug. 19, 1922) record the results of a series of over six hundred severe burns and pyogenic conditions treated in hospital wards continuously with flavine antiseptics (acriflavine or proflavine) by a simple method. The points specially investigated have regard to the rate and progress of formation of granulation tissue, ossification, and healing of skin epithelium. Only those cases are considered in which intimate contact of the tissue with the antiseptic occurred. As compared with other methods of treatment, there was clinically no interference with pellicle formation or necrosis. There was no tendency to hemorrhage beyond the slight oozing which occurs from the tips of well-vascularized granulations denuded of their surface in the act of changing dressings, and which is to be regarded as evidence of their healthy state. Ossification proceeded actively in periosteal

granulation tissue under application of flavine. Epithelial regeneration, both in the form of ingrowth from surrounding skin and from grafts, proceeded actively in contact with dressings soaked in flavine solution. Histological examinations in representative, unselected cases have confirmed and supplemented the clinical observations.

Reviews

THE HEART AS A POWER CHAMBER. A Contribution to Cardio-Dynamics. By Harrington Sainsbury, M.D., F.R.C.P. Oxford University Press, New York, 1922. Price $3.75.

Workers in physiology and pharmacology of twenty or thirty years ago were very familiar with the name of the author of the present volume, because of his work in association with Dr. Sydney Ringer of University College, London.

The present volume impresses one at once as having been written by a physician who is not only devoted to his profession, but also is a lover of the classics and a careful student of scientific investigation along medical lines. In other words, Dr. Sainsbury is a medical philosopher.

One of the first points that the author emphasizes, which is self-evident yet often overlooked, is that the heart and vessels are parts of one whole, namely, the circulatory apparatus. Too often physicians and others think of the heart alone and ignore the vessels, or think of them as if they were two separate organs not subject to the same influences and conditions.

The book is hardly one which the busy general practitioner will find of much service to him in every-day work, although repeatedly the author makes suggestions, which, when joined to one's experience, will undoubtedly prove useful. We note with interest that the author takes exception to some of the interpretations placed upon tracings by Sir James Mackenzie, although he is careful to state that he has the greatest respect for that investigator. He warns us against the danger of resting too largely upon mechanical aids to diagnosis. This he emphasizes by pointing out that for a long time physiologists taught that a negative pressure was generated within the ventricle during each diastole because of certain curves obtained by a manometer introduced into the cavity of the ventricle, yet at present he states that this teaching has gone completely out of vogue, for the simple reason that newer methods of recording have been devised and the theory of diastolic intraventricular negative pressure has ceased to exist.

Another point of interest in the volume deals with the effects of temperament and the state of the mind upon physiological function, which subject the author thinks is not given sufficient importance, and in this he is probably correct so far as the medical profession is concerned, although Christian Scientists and others will probably believe that his words can be used to advance their theories, which is far from the author's intention. This matter of temperament or mental effect on circulatory function is well dealt with a second time in the chapter devoted to Treatment.

Reverting once more to the tendency to place too much reliance upon instruments of precision rather than upon clinical observation, Dr. Sainsbury points out that while it would be highly improper to deny the value of the clinical thermometer, nevertheless its use has diminished the skill of the physician in studying febrile conditions and the symptoms which are associated therewith, the physician too often thinking of the patient as having so many degrees of temperature, when a very much more complete or complex picture ought to be before him, or to use the author's words, we must accept instrumental records gratefully, but never let them intervene or

separate us from the malady as it lives and moves in the patient.

In the chapter on Treatment the author thinks well of strychnine, caffeine and camphor as stimulants, apparently considering strychnine the best in an emergency. He states that he uses as much as a tenth of a grain to ward off nocturnal dyspnea, often combining it with one-sixth to one-quarter grain of morphine. He emphasizes the value of opium and morphine as distinctly tonic to the heart, and states unequivocally that in a state of collapse the heart is unable to develop its full power, and the kind of remedy here demanded is represented by pituitrin in the dose of ½ to 1 cc. He thinks that this should follow the treatment devoted to improving the tone of the heart muscle.

Concerning what is thought to be the modern use of digitalis in cases of auricular fibrillation, the author points out that while auricular fibrillation has been comparatively recently recognized, nevertheless the proper use of digitalis to benefit the patient who is suffering from failing circulation was long since well known and emphasized by the late Dr. Ringer.

Many physicians still think that auricular fibrillation is an indication for digitalis, whereas those who know most about it recognize that only when auricular fibrillation is associated with ruptured compensation, or cardiac failure, should this drug be employed.

A PRACTICAL MEDICAL DICTIONARY. By Thomas Lathrop Stedman, A.M., M.D. Seventh revised edition, illustrated. William Wood & Company, New York, 1922. Price $7.

Each succeeding edition of Stedman's Dictionary has been reviewed in words of praise in the pages of the GAZETTE. Perhaps we can say nothing better about it in the line of its usefulness than that it is constantly at hand to be referred to whenever occasion requires, and that it contains a remarkable amount of useful information, not limiting itself to definitions, but having a considerable amount of text devoted to informing him who searches its pages as to medical facts. As an instance, we find that under the name of "South Dakota Hot Springs" there is a statement not only of their temperature and their saline ingredients, but also six or seven lines are devoted to the maladies in which they are most commonly employed.

The volume is printed on thin paper, which, however, does not show the type on the other page, the print is good, the binding is flexible and stands wear well, and, last of all, differential tables and illustrations are given here and there with the object of making the book of practical value.

Notes and Queries

Wherein the Harrison Act Has Failed.

In an editorial referring to this subject, the *Boston Transcript* of June 12, 1922, states that in line with others who have spoken the last few years concerning the status of drug-addiction control, the editor of *The Druggists' Circular* calls for the support of the bill in Congress providing for a full, free and impartial investigation into the matter of narcotic drug addiction. It may be well to state that alcohol addiction and cocaine addiction are different in nature and are to be placed in a different category from that of the narcotic drugs.

Authorities agree that the Harrison Act was well-intentioned, and that its failure to accomplish its purposes has been due to its administration by officers without medical knowledge, whose regulations have failed to follow the real spirit of the law. Wherein it has been successful and wherein it has failed, is the theme of another article (unsigned) [an editorial article written by a member of the *Circular's* staff] in the

same periodical. The law was enacted December 17, 1914, and has been vigorously enforced by an army of national, State and local officers during this time. The line of enforcement has included the creation of an enormous number of officials whose salaries have imposed a tremendous cost upon the taxpayers. The right of physicians and pharmacists to prescribe and dispense narcotic drugs has been curtailed in a manner that a few years ago would have been deemed impossible. The regulations have gone so far as to deny the right to a physician to treat his patients excepting in a manner defined by a lay commissioner. Physicians and pharmacists have been compelled to register with the government, pay special taxes under the name of licenses, prepare inventories of their stocks of narcotic drugs, submit their stocks and records to frequent government inspection, use special order forms for narcotic drugs, employ special prescription blanks, and, what has been more annoying than any of the other items, keep themselves informed of frequent and oftentimes contradictory "decisions." These have imposed a burden which has caused many physicians to refuse to prescribe narcotic drugs, although they may normally be indicated, on account of the uncertainty in the administration of changing officials and regulations.

Then there have been continued prosecutions, without any evidence of laxity in awarding punishments and penalties. As one of the results of this machinery and activity the *Circular* states that the best medical and administrative evidence goes to show that the number of drug users has increased in the country, and more narcotic drugs are misused than ever before. There are probably more than one and one-half million narcotic drug addicts in the country to-day. The existence of so large a number under existing conditions has created a menace to the moral and physical welfare of the nation.

It may be well here to note the fact that there is an innocent addict. This condition seems to have been observed after the Civil War among soldiers who had had medical treatment in the hospitals, the result of which was a condition of the system demanding a regular supply of the drug or, this being lacking, imposing most excruciating pains, resulting not infrequently in death. Practically no study was given to the condition, so that there has been constantly an increase in the number of addicts whose addiction has resulted from no carelessness of their own.

Another result of the administration of the Harrison Act, noted by the *Circular*, is that the innocent addicts, virtually deprived of the help of their physicians through irksome restrictions, have been driven to illicit dealers. In a third matter the *Circular* speaks very plainly to the effect that "the Federal law is being interpreted and enforced in a manner calculated to further the private interests of a group of individuals and not to check the illicit use of narcotic drugs." This is a pretty strong charge, but one in which the *Circular* quotes authorities to substantiate it.

Rejuvenating Dried-out Adhesive Plaster.

The *United States Naval Medical Bulletin* for August, 1922, in reply to a query on this subject states that the best method is to unroll the plaster, and, without stripping off the muslin covering, wipe over with a gauze sponge wrung out of cottonseed oil. Warm over a radiator or in a sterilizer for an hour, and the result will be all that could be desired.